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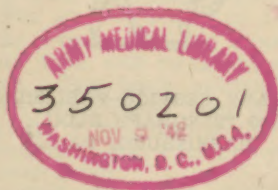






*War Coll. added*

# Medical Soldier's ... Handbook



The Military Service Publishing Co.  
100 Telegraph Bldg.  
Harrisburg, Pa.

[ 1941 ]

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## FOREWORD

You are now a member of the Army of the United States. That Army is made up of free citizens chosen from among a free people. The American people of their own will, and through the men they have elected to represent them in Congress, have determined that the free institutions of this country will continue to exist. They have declared that, if necessary, we will defend our right to live in our own American way and continue to enjoy the benefits and privileges which are granted to the citizens of no other nation. It is upon you, and the many thousands of your comrades now in the military service, that our country has placed its confident faith that this defense will succeed should it ever be challenged.

In the transition from civil life to the life of a soldier you may, at first, feel somewhat confused. It is the purpose of this handbook to help you over these rough spots as rapidly as possible and to lay the foundations for your successful career as a soldier.

Making good as a soldier is no different from making good in civil life. The rule is the same and that is—know your own job and be ready to step into the job of the man ahead of you. Promotion is going to be very rapid in this Army. Be ready for it. You will have little time to learn the duties of a noncommissioned officer after you become one. You will be expected to know those duties and show that you know them. At a moment's notice you may have to take charge of your squad as a corporal—and in a critical hour. In the same way when you are a sergeant you cannot tell under what conditions and at what hour you may have to take the place of your lieutenant. You want to know what is expected of you and be ready to do it.

The things that a trained soldier must know, and the way in which they are done, will be taught you as rapidly as you can absorb them. The basic military information is described and explained in this handbook so that it may be available constantly to you during the first weeks of your service. By mastering the contents your future progress will be much more rapid.

In making yourself an efficient soldier you are helping to build a defense for our country—that nothing can destroy. You are repaying your obligation to the United States for all the benefits of the past and are declaring your faith in our future. If you will make a part of yourself the following characteristics of the good soldier, you will be doing your part in upholding the glorious reputation of the Army of the United States:

*Be obedient.*—Obedience means to obey promptly and cheerfully all orders of your commissioned and noncommissioned officers. At first you cannot be expected to know the reason for everything you are ordered to do. As you remain longer in the service and you understand more of the reasons for military training you will find that everything has been

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figured out as the result of experience in the past. Ways and methods which have been successful in the past are continued until some new way proves to be better, and then the change will be made. Cheerful obedience leads to a better performance of your duties. It makes it easier for all of your comrades to do their part. It means better teamwork.

*Be loyal.*—Loyalty means that you must stand by your organization through thick and thin. Boost your organization at every opportunity. Be loyal and true to your officer/s, your noncommissioned officers, and your comrades. In this way you will be loyal to your country.

*Be determined.*—Determination means the bulldog stick-to-it-iveness to win at all costs. During your training keep everlastingly at the most difficult tasks and never give up until you have mastered them. Determination to win means success in battle.

*Be alert.*—Alertness means being always on your guard. A good soldier may be pardoned for failure, but never for being surprised. Should the unexpected happen, use your head and do something, even if it is wrong, rather than "lie down."

*Be a member of the team.*—Teamwork means that each man in the squad, platoon, company, troop, or battery gives everything in his power to make for the success of the whole unit. Success in battle depends on teamwork just as much as success in a football game depends on the pull-together spirit of the football team. Unless you play your own special part the team may not win.

## RECORD OF THE SOLDIER

Name .....

Army serial No. ....

Grade ..... Organization .....

Height ..... Weight .....

Born .....

(Date)

In case of emergency notify .....

(Name)

(Address) (Town) (State)

(Town)

(State)

Beneficiary (6 months' pay) .....

(Name)

(Relation) (Street and number) (Town and state)

(Street and number  
or rural route)

(Town and state)

Government insurance .....

(Policy number)

Other insurance .....

(Policy number)

Bank account .....

(City and state)

Company number .....

Watch .....

Regimental commander's name .....

Battalion commander's name .....

Company commander's name .....

Platoon commander's name .....

Squad leader's name .....



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## CHAPTER 1

### GENERAL INFORMATION

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#### SECTION I

##### RESPONSIBILITIES OF GROUP LIFE

1. Before you joined the Army you were a member of a family of closely related individuals who had many things in common. The members of your family shared the same dining room, the same bathroom, and the same amusements around the house. All worked together, played together, read the same newspaper, and were largely dependent upon each other for comforts, pleasures, and a living.

2. You learned that to get along well with other members of your family you must have consideration for them, do your part of the work, and share things with the rest of the household. That was your golden rule and the primary law of family relationship and citizenship.

3. You have the same obligations in the Army but instead of the small family group you are one of a much larger group. Several hundred may have to live together in one small area. Large numbers eat in the same mess hall, use the same bathhouse or latrine, bunk together, work together, and play together. Your bedding, your uniforms, your equipment, and your personal possessions will frequently be exposed where they can be removed without your knowledge. Living under these conditions you must do your part in respecting the rights and property of others. A soldier who has learned to respect the rights of his comrades has made a big step forward in his training as a soldier and as a citizen.

#### SECTION II

##### RELATIONSHIP WITH NONCOMMISSIONED OFFICERS AND OFFICERS

4. For every business, every game, every group activity, and in every walk of life there is a leader, a "boss," an executive, or some directing agency. In the Army these group leaders are the officers and the noncommissioned officers.

5. The President of the United States is the Commander in Chief of the Army. He appoints officers, with the consent of the Senate, to assist him in the details of running the Army. He gives them certain authority and makes them responsible for certain groups or organizations in accordance with their grade and length of service.

6. You have a commander in charge of your company, battery, or troop, who is responsible for everything your company does or fails to do. He must see that you are properly trained, and that you are fed, clothed, and sheltered. He must look after your health, your comfort, and your amusements. He could not possibly attend to all these details alone. Suppose that your company commander had to go to every individual soldier, give him special instructions, explain what to do and what not to do, draw rations, issue equipment, keep all your records, and do all of the many things which you require. You can see that many things would be neglected and that you would suffer for lack of proper training, food, equipment, and amusements. To assist him in all the details of running the company he asks the regimental commander to appoint noncommissioned officers who are given certain authority and are made responsible for certain things. You are thus a part of a great organization or business in which the officers and the noncommissioned officers are the executives, the "bosses," and the foremen.

7. The first thing to appreciate is that you are subject to the orders of officers and noncommissioned officers placed over you. The officers and noncommissioned officers are *entitled to be*, and they *must be* obeyed and respected by all soldiers under them. Make it a rule that you will obey them promptly, cheerfully, and carefully. A military order is usually sharp, positive, and brief. If you do not understand what is wanted, it is your duty to ask questions, but do not quibble over small details as to your "rights." The man who is always thinking of his "rights," rather than his duty, makes a poor soldier.

8. If you believe that you have been given an unlawful order you should obey first and make a report to your commanding officer afterwards. Disobedience or failure to obey a lawful order, which you may believe to be unlawful, may lead to severe consequences.

9. The Articles of War, the soldier's law, authorize your commanding officer to impose certain punishments for minor offenses. That is, he can withhold certain privileges, restrict you to the area of barracks or camp for a week, or require you to perform extra duty or hard labor for as much as a week. However, he does not delegate this authority to his noncommissioned officers. A noncommissioned officer is not authorized to administer any form of punishment to a member of his command. A noncommissioned officer may require you to sweep the barracks floor, wash the squad-room windows, and the like but he does this by regular detail from all the members of your company, not as a punishment.

10. It is the duty of a noncommissioned officer at all times and under all circumstances, whether on duty or off duty, to check promptly all disputes, quarrels, or disorderly conduct which might bring discredit upon the service. He is required to enforce the orders and regulations governing the conduct of soldiers. In the absence of an officer, a noncommissioned officer may place a soldier under arrest until he can be seen by his company commander.

11. It can be seen that officers and noncommissioned officers must be specially selected. They hold positions of responsibility and honor, but they belong to the same military organization that you do. The relationship between all military men is one of comradeship, friendliness, and helpfulness. In no walk of life does "comradeship" mean so much as in the military service and nowhere are obedience and respect for authority so important as in the Army. As a soldier you must accept constituted authority, which is nothing more than team play. In your relationship with officers and noncommissioned officers you are expected to be loyal and truthful. Always be frank but courteous. By being courteous and respectful to constituted authority you are exhibiting qualities of a good soldier.

### SECTION III

#### RELATIONS WITH CIVILIANS

12. In his off-duty activities, whether in peace or war, the good soldier is always careful to be courteous and considerate toward civilians. You must realize that your organization and the Army will be judged by the conduct and appearance of its members in public. Any misconduct on your part in a public place will bring discredit not only upon yourself but also on the military service. You must take pains on every occasion to win the respect and confidence of all with whom you come in contact.

13. When on duty your relations with civilians are governed primarily by the orders and instructions of your commanding officer. Here also, whether in peace or war, you should treat civilians with all courtesy and consideration consistent with a strict observance of your orders and the accomplishment of your military mission.

14. The American Red Cross acts as the medium of communication between the Army and the civil community. This organization has chapters or representatives in all parts of the United States and its foreign possessions. If you should be concerned about the welfare of your family or conditions in your home, explain the situation to your company commander. He will help you in obtaining the assistance of the Red Cross through the Red Cross field director at your station or serving your unit.

### SECTION IV

#### MILITARY OBLIGATIONS

15. a. Every man who enters the Army of the United States, whether through voluntary enlistment or operation of the Selective Service Law, accepts certain solemn obligations. These obligations require that he bear true faith and allegiance to the United States of America; that he serve them faithfully against all their enemies; and that he will obey the orders of the President of the United States

and the officers appointed over him (the soldier) according to the rules and Articles of War.

Your legal status has changed from that of a civilian to that of a soldier. You have become subject to military law and cannot again become a civilian until you receive your discharge by proper authority. As a civilian you could quit your job and seek other employment at will. As a soldier you have given up that privilege during the period of your service. During your off-duty hours as a civilian you could go when and where you pleased without asking permission from anyone. As a soldier you must first get permission before leaving your proper station.

b. The reasons for these differences in your status as a civilian and as a soldier are important but easy to understand. The military organization to which you now belong is a team that must be constantly trained and ready for duty in any emergency. If its members could go and come whenever they cared to there would be no assurance that this military team would be on hand when needed.

16. As a soldier, then, you must keep in mind and faithfully fulfil your obligations. If you do so you will find the service pleasant and profitable, and will leave it as a veteran with a clean record which will entitle you to the benefits accorded by law to an honorably discharged ex-serviceman. Soldiers who constantly fail to fulfil these obligations are likely, sooner or later, to get into trouble, to lose the respect and regard of their comrades, to suffer punishments, and perhaps, finally to return to civil life dishonored and disqualified for any of the benefits with which the Government rewards honorable and faithful service.

## SECTION V

### THE ARTICLES OF WAR

17. The Articles of War are part of the military laws enacted by Congress to control the conduct of those in military service of the United States. They govern the administration of military justice. They define the offenses for which soldiers may be tried by court-martial, prescribe the composition and procedure of courts-martial, and fix the limits of punishment that may be imposed by these courts.

18. The Articles of War are read to every soldier shortly after he enters the service and at regular intervals thereafter, so that no one will be able to excuse himself for a violation of any of them upon the ground of ignorance of their provisions.

19. However, as a good soldier, resolved to observe fully and in good faith the obligations of the oath of enlistment above discussed, you do not need to spend much time studying the detailed provisions of the Articles of War. As a general rule, they prohibit and penalize only such conduct as the person of ordinary intelligence will readily recognize to be wrong. The man who is resolved to do the right thing and carries out that resolution at all times, is very unlikely to violate any of the Articles of War. Should doubt ever arise in your mind as to

whether anything you plan to do is improper or a violation of the Articles of War, don't hesitate to take the question to some more experienced comrade, to your first sergeant, or to your immediate commanding officer. They will be glad to advise you.

## SECTION VI

### POST AND STATION ACTIVITIES

20. Although you have exchanged your civilian community for a military community, you will find many of the same activities on your post or station that you have known in civil life. For example, your own organization will probably have a barber and a tailor. All soldiers are required to have a short haircut known as a "military" haircut. This is done for sanitary reasons and to secure uniformity. Your organization barber is approved by your organization commander, and is required to maintain a sanitary establishment, which is inspected regularly by the post surgeon. Your organization tailor is prepared to clean and press your uniform and make necessary alterations and repairs. Both of these activities are maintained for the service and convenience of the members of your organization. The prices are fixed by the post commander so that they will be well within your means. You will be given credit by these activities and can pay for whatever service you have received at the end of each month.

21. The *post exchange* is the community store, owned jointly by you and all other men on your post. It is operated under the supervision of the commanding officer and the post exchange officer entirely in your interests. All profits made in this store come back to you and your comrades in the form of recreational activities, the furnishing of your organization day room, and other similar benefits. No individual shares in these profits, and under Army Regulations, profits may be expended only for the welfare of the soldiers as a whole. The post exchange will probably operate a general store, a shoe repair shop, a barber shop, and a tailor shop. Your organization orderly room will issue you, on credit, a certain amount of post exchange coupons each month, which will be accepted by all post exchange activities. The cost of these coupons will be collected at the pay table at the end of the month.

22. There will also be a *motion picture theatre* on your post operated by the United States Army Motion Picture Service, at which will be shown one or two shows each night, or as announced from time to time. There will also be occasional free shows. The price of attendance for the regular shows is small, and payment may be made in cash, post exchange coupons, or in theatre coupons. Theatre coupon books may be obtained on credit and paid for at the end of the month in the same manner as post exchange coupon books.

23. A *photograph shop* will also probably be operated by your post exchange. The photographer will make a specialty of taking photographs of soldiers at a very small cost, for which he will accept either cash or post exchange coupons.

At your early convenience, have your photograph taken in your uniform, and send it home to a member of your family. They will be glad to have it and so will you, after you have returned to civil life.

24. There are also a number of other recreational activities on your post in which you are encouraged to participate during your off-duty hours. These will probably include bowling alleys, shooting galleries, baseball fields, and basketball and volley ball courts. They are provided for your enjoyment, and you should take advantage of them at every opportunity. Your first sergeant will be glad to explain how you can use them and where to obtain the necessary equipment.

25. Your organization has a bulletin board just outside of the orderly room or organization headquarters tent. Make it a practice to read the contents of the bulletin board several times each day. On it will be posted various company and guard details as well as announcements as to the uniform and equipment to be worn on different occasions, the time and place where you will receive your pay, motion picture programs, and other items of interest to you.

## CHAPTER 2

### MILITARY DISCIPLINE AND COURTESY

#### Paragraphs

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#### SECTION I

##### MILITARY DISCIPLINE

26. The average civilian or recruit coming into the Army, often misunderstands the meaning of the words *military discipline*. He thinks of them as being connected with punishments or reprimands which may result from the violation of some military law or regulation. Actually, discipline should not be something new to you for you have been disciplined all of your life. You were being disciplined at home and in school when you were taught obedience to your parents and teachers, and respect for the rights of others. On your baseball or other athletic team you were disciplining yourself when you turned down the chance to be a star performer in order that the team might win; you were acquiring discipline in the shop, or other business, when your loyalty to your employer and your fellow employees was greater than your desire to secure your own advancement. All of this was merely the spirit of team play; that is, you were putting the interests of the "team" above your own in order that the "team" might win.

27. The word "company," "troop," or "battery" is merely the military name for a *team*, and military discipline is nothing more than this same spirit of team play. It is the most important thing in the Army. In civil life lack of discipline in a young man may result in his getting into trouble which will cause his parents and teachers regret or sorrow; it may cause a member of an athletic team to be "sent to the bench," or cause an employee to lose his job. In the Army it is far more serious. Here lack of discipline in a soldier may not only cost him his life and the life of his comrades, but cause a military undertaking to fail and his team to be defeated. On the other hand a team of a few well-disciplined soldiers is worth many times a much larger number of undisciplined individuals who are nothing more than an armed mob. History repeatedly shows that without discipline no body of troops can hold its own against a well-directed and well-disciplined enemy.

28. In your work in the Army you may wonder why the officers and noncommissioned officers insist on perfection in what appears to be minor details. Why do rifles have to be carried at just the same angle; why do you have to keep accurately in line; why must your bed be made in a certain way; why must your uniform and equipment be in a prescribed order at all times; why must all officers be saluted with snap and precision? These things are part of your disciplinary training. Their purpose is to teach you obedience, loyalty, team play, personal pride, pride in your organiza-

tion, respect for the rights of others, love of the flag, and the will to win.

29. So you see that being disciplined does not mean you are being punished. It means that you are learning to place the task of your unit—your team—above your personal welfare; that you are learning to obey promptly and cheerfully the orders of your officers and noncommissioned officers so that even when they are not present you will carry out their orders to the very best of your ability. When you have learned these things and prompt and cheerful obedience has become second nature to you, then you have acquired *military discipline*—the kind of discipline which will save lives and win battles.

## SECTION II

### MILITARY COURTESY

30. In your home and school you were taught to be polite and considerate in your speech and attitude to your parents, your teachers, and your comrades. That was courtesy. Military courtesy is the same thing except that the military man is so proud of his profession and has such high respect for the men who belong to it that in the Army courtesy is more carefully observed than in civil life. Military courtesy is a part of military discipline. The disciplined soldier is always courteous whether on duty or off, whether to members of the military service or to civilians. To help you in quickly becoming a well disciplined and efficient member of your team, the following are some of the more common occasions on which you may have an opportunity to demonstrate your military courtesy. The rules are few and simple, but they have an important bearing on your career as a soldier.

a. The *military salute* is the courteous recognition between members of the armed forces of our country. The salute is a privilege enjoyed only by members of the military service in good standing; prisoners do not have the right to salute.

b. The salute is given when you meet a person entitled to it. Those entitled to it are all officers of our Army, Navy, Marine Corps, and Coast Guard. It is also customary to salute officers of friendly foreign countries when they are in uniform.

c. The salute should be given when you can easily recognize that the person is an officer and entitled to it. Usually this is at a distance of not more than 30 and not less than 6 paces, in order that the officer may have time to recognize and return it.

d. When you execute the salute turn your head so that you observe the officer and look him straight in the eye. The smartness with which you give it indicates the pride you have in your profession. A careless or half-hearted salute is discourteous. (See fig. 24.)

e. In posts, camps, or stations, the salute is always given whenever you recognize an officer, even though one or both of you are in civilian clothes. It is likewise given whether

or not you are wearing a head covering. For rule when outside post, camp or station see paragraph 31j.

f. If the officer remains in your immediate vicinity without talking to you, no further salute is necessary when he departs. If a conversation takes place however, you should again salute when either you or he leaves.

g. (1) If you are one of a group of soldiers, not in formation, call the group to attention as soon as you recognize an officer approaching, unless some other member of the group has already done so. If the group is out of doors, all members of the group salute; if indoors or in a tent, all remove their head covering and stand at attention unless otherwise directed.

(2) If the group is in formation out of doors, it is called to attention by the one in charge and he alone gives the salute.

(3) If you meet an officer on a staircase or in a hallway, halt and stand at attention.

h. The salute is given only at a halt, or a walk. Either mounted or dismounted, always bring your gait down to a walk before saluting. Except in the field under campaign conditions, always dismount before speaking to or replying to a dismounted officer.

i. If you report to an officer in his office, first remove your headdress, unless you are carrying your rifle or side arms, and enter when told to do so. March up to within two paces of the officer's desk, halt, salute, and state, "Sir, Private — reports to —." (For example, "Sir, Private Jones reports to the Company Commander.") After reporting, carry on the conversation in the first and second person. When the conversation is ended, salute, make an about face, and withdraw. Unless you are carrying your rifle or side arms, always remove your headdress when entering a room where an officer is present.

j. If you are driving a motor vehicle, salute only when the vehicle is halted. If it is an animal-drawn vehicle, salute only when both hands are not required to control your team. Any other soldier in the vehicle salutes whether the vehicle is at a halt or in motion, unless there are a number of soldiers in the vehicle in charge of an officer or noncommissioned officer. In this case only the officer or noncommissioned officer gives the salute.

k. When you are dismounted and not in formation and the National Anthem is played, or "To the Colors." sounded, at the first note face the music, stand at attention and give the salute. At "Escort of the Color" or "Retreat," face toward the color or flag. If you are in civilian clothes and wearing a headdress, stand at attention, remove your headdress and hold it over your left breast. If you are in civilian clothes and not wearing a headdress, stand at attention and execute the hand salute. Hold the salute until the last note of the music. If you are mounted and not in formation, halt and give the salute while mounted. Vehicles in motion will be brought to a halt. If you are riding in a passenger vehicle or on a motorcycle, dismount and salute. In other types of military vehicles, as for example troop carriers, trucks, and escort wagons, all individuals except the person in charge of the vehicle remain

seated or standing (depending on whether they are riding seated or standing) in the vehicle at attention. The person in charge of the vehicle, unless he be a tank commander or the driver of a horse-drawn vehicle, dismounts and renders the salute. Tank commanders salute from their vehicles. Drivers of horse-drawn vehicles remain in their vehicles and salute only if both hands are not required to control their teams. Individuals leading animals or standing to horse stand at attention but do not salute. The same respect is shown the national anthem of any other country when it is played on special occasions.

l. If you are passing, or being passed, by an uncased national color render the same honors as when the National Anthem is played.

m. Whenever you are present but not in formation while personal honors are being rendered, salute and remain in that position until the completion of the ruffles, flourishes, and march.

n. (1) In garrison, if posted as a sentinel with a rifle, you will salute by presenting arms. During the hours when challenging is prescribed, the first salute to an officer is given as soon as he has been recognized and advanced.

(2) While posted as a sentinel, if you are talking to an officer, do not interrupt your conversation to salute another officer. However, if the officer to whom you are talking salutes his senior, you will also salute.

o. If you are attending a military funeral not as a member of a formation, and whether in uniform or civilian clothes, stand at attention, remove your headdress, and hold it over your left breast at any time the casket is being moved by the casket bearers and during the services at the grave, including the firing of volleys and the sounding of taps. During the prayers, bow your head. If the weather is cold or inclement, keep your headdress on and give the hand salute whenever the casket is being moved by the casket bearers, and during the firing of volleys and sounding of taps.

31. The following situations will assist you in remembering when you do not or need not salute:

a. If you are in ranks and not at attention and an officer speaks to you, come to attention, but do not salute. The officer or noncommissioned officer in command of your unit will give the salute for the entire organization to the person entitled to it.

b. If an officer enters the mess room or mess tent, you remain seated, "at ease," and continue eating unless the officer directs otherwise. If the officer speaks directly to you, remain seated "at attention" until the conversation is ended, unless he directs otherwise.

c. Members of details at work do not salute. The officer or noncommissioned officer in charge will salute for the entire detail.

d. When actually taking part in games you do not salute.

e. When standing to horse or leading a horse do not salute.

f. In churches, theatres, or other places of public assemblage, or in a public conveyance, do not salute. Indoors, salutes are not given except when reporting to an officer.

g. Do not salute when carrying articles with both hands or when you are otherwise so occupied as to make saluting impracticable.

h. If you are posted as a mounted or dismounted sentinel and are armed with a pistol, do not salute after challenging. Stand at "Raise Pistol" until the officer you have challenged has passed.

i. When on a march in campaign, or under simulated campaign conditions, do not salute.

j. Off duty, and when you are not in a post, camp, or station, the salute is optional unless you are addressed by an officer.

32. While officers and noncommissioned officers will usually address you by your last name, always use their title in addressing them. The following titles are used in the military service:

a. All general officers are addressed as "General"; lieutenant colonels are addressed as "Colonel"; and both first and second lieutenants as "Lieutenant."

b. All chaplains, regardless of grade, are addressed as "Chaplain." Catholic chaplains may be addressed as "Father."

c. Warrant officers are addressed as "Mister."

d. Members of the Army Nurse Corps are addressed as "Nurse."

e. Noncommissioned officers are addressed as "Sergeant" or "Corporal." Master sergeants, technical sergeants, and staff sergeants are all addressed as "Sergeant."

33. As the result of the observance of military courtesy in our Army for many years, certain customs have come into existence which are recognized as our unwritten law of conduct. Every civilian community, school, or business has its own customs, and a newcomer should learn them as quickly as possible so that he will not be embarrassed. In the same way, you will discover that your own organization probably has its own local customs, many of which date from some event in the organization's history, and of which it is very proud. You should become familiar with these customs as early as possible. The following are a few of the general customs which are observed throughout our Army, and which you should know.

a. If you wish to speak to your company, battery, or troop commander, first obtain permission from your first sergeant. The company commander will always see you, but he may be busy at the time or the first sergeant may be able to answer your question.

b. If you wish to deposit some of your money on pay day, notify your first sergeant before reporting to receive your pay.

c. When you report to your company commander for pay, halt directly in front of him and salute. After receiving your pay count it quickly, execute a right or left face and depart.

d. Do not salute with one hand in your pocket, while smoking, or with your coat unbuttoned or partly unbuttoned.

e. If you should be accompanying a dismounted officer walk on his left; if both you and the officer are mounted ride on his left.

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## SECTION I

## ARMS AND SERVICES

**34. Insignia.** Each of the various arms and services in our Army has a particular "mark" of its own which is worn by all of its members. It serves to distinguish those members from all other soldiers of the Army and is a part of the uniform. These various marks are called insignia and usually consist of two types: the metal insignia which you will wear on the collar of your shirt or the lapel of your coat, and the colored hat cord which you will wear on your service hat.

**35.** To assist you in becoming quickly familiar with the various types of insignia and so that you can tell at a glance to which arm or service a soldier may belong, they are shown in figure 1.

**36. Hat Cord.** At a distance it will be easier to recognize the arm or service to which a soldier belongs by the color of his hat cord. You should be familiar with the following colors and the arm or service which they identify. Where two colors are given, the cord is of the first color and the acorns and keeper are the color of the piping.

- a. Air Corps—Ultramarine blue piped with golden orange.
- b. Cavalry—Yellow.
- c. Chemical Warfare Service—Cobalt blue piped with golden orange.
- d. Coast Artillery Corps—Scarlet.
- e. Corps of Engineers—Scarlet piped with white.
- f. Field Artillery—Scarlet.
- g. Finance Department—Silver-grey piped with golden yellow.
- h. Infantry and Tanks—Blue.
- i. Medical Department—Maroon piped with white.
- j. Military police—Yellow piped with green.
- k. Ordnance Department—Crimson piped with yellow.
- l. Quartermaster Corps—Buff.
- m. Signal Corps—Orange piped with white.

**37. Arm Band.** In addition to the identification marks described above, sometimes you will see certain soldiers wearing arm bands to show the particular type of work they are doing. These arm bands are called "brassards" and are worn on the left sleeve above the elbow. You will want to know the following brassards and what they mean—

- a. Blue, with the letters "MP" in white—Military Police.
- b. Red, with the word "Fire" in white—Members of fire departments.
- c. White, with red cross in center—Geneva Convention Red Cross.
- d. White with green cross in center—Veterinary Green Cross.



REGULAR ARMY &  
(Not assigned  
to regiment)



ORGANIZED RESERVE  
(With regimental  
number)



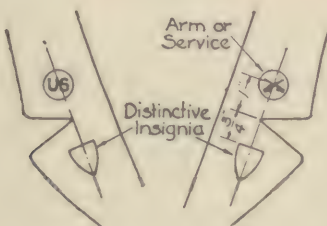
NATIONAL GUARD  
(Not assigned  
to regiment)



(With regimental  
number)



AIR CORPS



CAVALRY



CHEM. WARFARE  
SERVICE



COAST ART.  
CORPS



CORPS OF  
ENGINEERS



FIELD  
ARTILLERY



FINANCE  
DEPARTMENT



INFANTRY



MEDICAL  
DEPARTMENT



NAT. GUARD  
BUREAU



ORDNANCE  
DEPARTMENT



QUARTERMASTER  
CORPS



SIGNAL  
CORPS



DETACHED  
ENLISTED MEN

Figure 1. Collar Insignia for Enlisted Men.

**38. Service Stripe.** Each enlisted man who has served honorably in the military service for three years wears the service stripe. This stripe is worn 4 inches from the end of the left sleeve of the service coat. For each additional period of 3 years, another service stripe is worn.

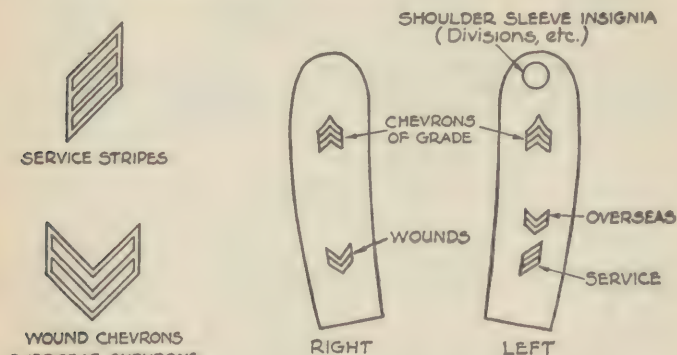


Figure 2. Wearing of Sleeve Insignia.

**39. Wound and war service chevrons** are worn only by those entitled to them. They are worn only on the woolen service coat, with the wound chevrons on the right sleeve and the service chevrons on the left sleeve. They are worn point



Figure 3. Badges for Qualification in Use of Weapons.

Other bars to be attached to basic badges are as follows:

MACHINE RIFLE  
AUTO. RIFLE  
SMALL BORE RIFLE  
BAYONET  
PISTOL-D  
PISTOL-M  
SMALL BORE PISTOL  
MECHANIZED VEHICLE  
WEAPONS  
INF. HOWITZER  
MACHINE GUN

SMALL BORE M. G.  
SUBMACHINE GUN  
GRENADE  
COAST ARTY.  
FIELD ARTY.  
C. W. S. WEAPONS  
MINES  
AERIAL GUNNER  
AERIAL BOMBER  
ANTI-AIRCRAFT WEAPONS

down. When service stripes are worn the war service chevron is above the uppermost service stripe. (See fig. 2.)

**40. Badge.** Soldiers are classified according to the qualifications attained in the use of weapons. The different classifications are: expert, sharpshooter or 1st class gunner, and marksman or 2d class gunner. Should you attain one of these classifications you will be entitled to wear a badge (fig. 3) which is issued by the War Department. A bar, attached to the bottom of the badge, shows the weapon with which you have qualified. Should you qualify with more than one weapon, you will be entitled to wear an additional bar for each weapon.

## SECTION II

### OFFICERS AND NONCOMMISSIONED OFFICERS

**41.** Commissioned officers and noncommissioned officers also wear the insignia of the arm or service to which they belong and in addition certain other distinguishing marks which show their grade or authority in the Army. The insignia of grade worn by all officers on each shoulder loop of the coat, overcoat, or olive-drab shirt when worn without the coat, are shown in figure 4.

**42.** A general officer wears two bands of black braid just



Figure 4. Insignia of Rank for Officers (Worn on Shoulder Loops).

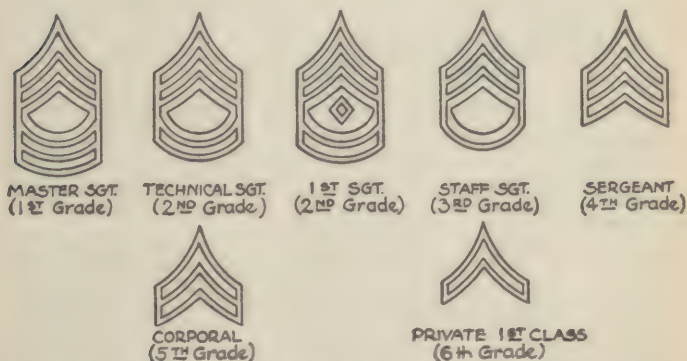


Figure 5. Chevrons (Insignia of Grade) for Noncommissioned Officers and Privates, First Class (Worn on Sleeves).

above the lower edge of each sleeve of the overcoat.

43. Officers of the General Staff Corps wear a band of black braid 3 inches from the end of each sleeve of the service coat. All other officers wear a similar band of brown braid. All warrant officers and enlisted men who served honorably as officers in the World War wear a similar band of forest green braid.

44. Noncommissioned officers wear chevrons of olive-drab material on a dark blue background. They are worn on the sleeve between the elbow and the shoulder of the olive-drab shirt, the coat, the overcoat, and the fatigue uniform. The chevrons for the different grades are shown in figure 5.

## CHAPTER 4

### ORGANIZATION

45. You are going to hear the word "organization" used constantly in your military service and it will help you to have an early understanding of just what the word means in the Army. If you think about it for a moment you will realize that, actually, organization is nothing new, for you have probably been familiar with its meaning for a long time in civil life. In your factory, shop, or office you remember how men were grouped according to the machine they operated or the type of work they did. The same thing was true in school where students were grouped by classes according to their progress and the number that each teacher could instruct. You are familiar with the way in which your local police and fire departments are divided into precincts or districts located in different parts of the city with one particular man in charge of each station.

46. All of this grouping and arranging is for just one purpose—to get things done in the best way possible and without waste of time or effort. If every shop or office worker did only the things he wanted to do, and in his own way, his business would soon fail for he could not turn out his orders on time. If every student studied only the things he was interested in and only when he felt like it, we would soon be a nation of poorly educated people. If each time a fire occurred, the fire chief had to telephone the different firemen and tell them what to do, there would be little chance of saving many buildings. So, in order to direct the business workers, students, and firemen in their efforts, and to produce efficiency instead of confusion, they are divided into groups of a size which experience has shown one man can control. In charge of these groups are the foremen, chief clerks, teachers, or other group leaders you remember in civil life.

47. The same arrangement exists in the Army and for the same purpose. You have been assigned to a company, troop, or battery of a certain regiment. In charge of your company, troop, or battery is an officer who is responsible for feeding, clothing, and training you and your comrades, and, finally, leading you to victory on the battlefield. He is your team captain. Your company, troop, or battery has in it from 100 to 200 men. If it were always going to be on the drill field, or

in the barracks, the company commander could probably control it with his voice. But your team may not always remain in an area where the company commander can directly control it. It is training for the time when, if called upon, it will meet and defeat the enemy on the battlefield. There the distances and noise will make it impossible for the company commander to control directly more than a few men. So, to make sure that all the members of the team are exerting their efforts toward the same end, your company, troop, or battery is divided into a number of smaller groups called squads, sections, and platoons.

48. a. In the Infantry and Cavalry the *squad* is the largest unit that can be effectively controlled by the voice and signals of its leader—the corporal or sergeant. In size it will vary from 4 to 16 members, depending upon the kind of squad it is. It takes its name from the principal weapon within the squad. For example, in a "rifle squad" the members are armed with the rifle; in a "machine-gun squad" the principal weapon is the machine gun which members of the squad serve, and in a "mortar squad" the principal weapon is the mortar. The squad is small enough so that the leader can directly control all of its members.

b. In the Field Artillery and Coast Artillery Corps the *section* is the smallest fighting unit. In these arms, squads are sometimes used for purposes of drill or administration. For combat, however, the members of the section are usually close enough to the gun they serve so that their leader, the sergeant, can control them.

49. Next above the squad or section is the *platoon*, which is commanded by a lieutenant. A platoon includes several squads, or two sections, and has a strength of 40 or 50 soldiers. By the time we have reached a unit of this size you can see how difficult it would be for the lieutenant to control directly the actions of all members of the platoon while they are scattered over a large area in combat. He can easily control them, however, through his orders to his section or squad leaders.

50. a. Finally we come to your *company, troop, or battery*. It usually consists of 3 or 4 platoons and is commanded by a captain. Because of the way your company is "organized" it is possible for the company commander to control and direct efficiently the company as a whole through his orders to the platoon, section, and squad leaders and still have time to plan for the future care and welfare of the company. It would not be possible for him to do this if he did not have such an "organization," but had to spend his time constantly running back and forth, issuing orders to 200 individuals.

b. The organization of your company which has been discussed above deals with it as a fighting team. But to be able to fight effectively, it must be fed, clothed, and supplied with the necessary equipment. To assist the company commander in doing this, he has a company headquarters, whose principal noncommissioned officers are the first sergeant, the mess sergeant, and the supply sergeant. The first sergeant corresponds to the executive, or chief clerk, in a civilian office. He handles all of the administrative details of the company

and publishes the orders of the company commander. The mess sergeant with his cooks secures and prepares the food you eat, and the supply sergeant issues you your clothing and equipment and exchanges it when it has become worn out or damaged. Your company is a carefully organized business with the various jobs so distributed that the largest possible number of men can be made available for its principal job of fighting.

51. The same considerations followed in the organization of your company, troop, or battery are carried on upward to your regiment. In the Infantry, Field Artillery, and Coast Artillery Corps, usually 4 companies or batteries are grouped to form a battalion, but there may be only 2 or 3. Similarly, in the Cavalry, troops are grouped as squadrons. These larger units, battalions or squadrons, are commanded by a major or lieutenant colonel. The regiment is composed of 2 or more—generally 3—battalions or squadrons and is commanded by a colonel. So you see how each unit from the 4-man squad up to the 500- or 1000-man battalion fits into a definite place in the big regimental team. Each unit is so organized that one man will be able to control and direct it so that the full power of the team will be directed toward a common purpose.

52. In certain arms of the Army you may find that one or more of the various units described above are not included in the organization for combat of that arm. In the Air Corps you will not find the squad, section, or platoon as fighting teams but only organized temporarily for drill and administrative purposes. The unit to which you will be assigned is a squadron, commanded by a major. The squadron, however, will be divided into sections which are named for the duties the members of that section perform. For example, the administrative section handles the squadron headquarters, mess, and transportation; the technical section does the engineering, supply, communication, photography, and repairs; and the flight section operates and maintains the aircraft of the squadron.

53. In the same way, in certain armored units the smallest organization will be the crew of a scout or combat car, which will consist of 4 men, one of whom will be an officer or noncommissioned officer. Also certain infantry units such as tank, antitank, and military police organizations will vary in size and numbers. But you will not be confused, in whatever organization you may be, if you will remember the purpose for which the Army is organized in every arm or service. It is necessary to secure the efficient control of all members of the team for success in battle.

## CHAPTER 5

### CLOTHING

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Section II. Care of clothing .....	56-58
Section III. Wearing the uniform .....	59

#### SECTION I

##### ALLOWANCES

54. When you enlisted or were inducted into the Army, you made a contract with your Government. Your part of the contract was to serve faithfully the United States of America against all their enemies. It was an obligation you were glad to assume in return for the many privileges you and your family have received as citizens of a free nation. As its part of the contract the Government agreed to pay, feed, clothe, and give you medical care during the time you were in the military service.

55. You will be issued, without charge, all the articles of clothing necessary for the duties you will be required to perform. Whenever any item of this clothing is no longer serviceable, you may turn it in to your supply sergeant, who will replace it without charge. You must remember, however, that these articles of clothing are the property of the United States and are issued for your use while you are in the military service. If they are lost, damaged by your neglect, or unlawfully disposed of, the Government will require you to pay for them.

#### SECTION II

##### CARE OF CLOTHING

56. Always remember that your uniform is more than a mere suit of clothes that is worn to cover and protect your body. It is the symbol of the honor, the tradition, and the achievements of our Army. The civilian or soldier who is careless in his dress and appearance is probably careless in everything else. You owe it to your comrades, your organization, and your Army to be neat and careful in your appearance, for officers and men of other organizations will judge your company by the impression you make.

57. By being careful of your uniform, you have many advantages over a careless soldier. Your clothing will last longer, you will be neater and better dressed, and you will make a better impression on your comrades and officers.

58. The following information will assist you in the care of your clothing:

a. Whenever you wear the uniform, either on or off duty, be sure that it is complete and that it conforms to the instructions of your post, camp, or station. Have your shirt, coat, and overcoat buttoned throughout. Keep your uniform clean, neat, and in good repair.

b. Dandruff, dust, or cigarette ashes on a uniform give a bad impression. If possible, keep a whisk broom in barracks for brushing your uniform. Promptly replace missing buttons and insignia.

c. Keep your woolen uniforms pressed. This not only improves the appearance of clothing, but actually increases its life.

d. Clothing not in use should be hung in wall lockers whenever available. If there are no wall lockers, fold your clothing carefully and put it away where it will not accumulate dust. Uniforms that have become wet or damp should not be folded until they are dry. It is also a good idea to inspect clothing before putting it away. Missing buttons and rips should be attended to as soon as you take off your clothing instead of waiting until it is again needed.

e. Grease spots on uniforms are unsightly and unmilitary. The sooner a grease spot is removed, the easier. Usually it helps to place a folded clean towel under the soiled part of the cloth during the cleaning. The cleaning should be done by dampening a clean white cloth with a good commercial cleaning fluid and rubbing gently back and forth in a straight line over a larger area than the spot until dry. This usually prevents leaving a ring on the fabric. Turpentine will remove paint spots from clothing if used promptly, before the paint gets dry.

f. Insignia and buttons having a gold finish should be cleaned with ammonia and water. Don't use an abrasive, as it will remove the gold plating. Rubber bands, manila paper, or any material containing sulfur, if near medals, insignia, or buttons, will tarnish them.

g. Keep and wear your service hat in the shape in which it is issued. Brush it frequently to remove dust. Be sure that the hat cord is sewed on.

h. (1) In cleaning your boots or shoes, first remove all dirt or mud by scraping with a dull instrument such as a sliver of wood. Do not use a piece of glass or a knife. Next, wash them with a sponge saturated with a heavy lather of castile soap. Never use hot water or allow the leather to soak in water. Wipe off the lather with the wet sponge and rub the leather thoroughly and vigorously with a clean cloth until nearly dry. Drying by exposure to the sun, fire, or strong heat will cause the leather to stiffen and crack and is forbidden. Stuffing the toes with crumpled paper helps in the drying and tends to hold them in shape. After boots or garrison or dress shoes have dried, a good polish should be applied, provided that it has been authorized by the garrison or unit commander. In the case of work shoes an application of dubbing should be well rubbed in.

(2) For other articles of leather equipment, clean as described above. In the case of unfinished leather, while it is still moist give it a very light coat of neat's-foot oil by rubbing with a soft cloth moistened with the oil. Any oil not absorbed by the leather should be wiped off. If more than a light coat of oil is given, the leather will be greatly darkened and will soil your clothing. If the leather is to be polished it should be cleaned as described above and then polished with a good grade of polish in the proper color.

## SECTION III

## WEARING THE UNIFORM

59. The manner in which your uniform should be worn is shown in figure 6.

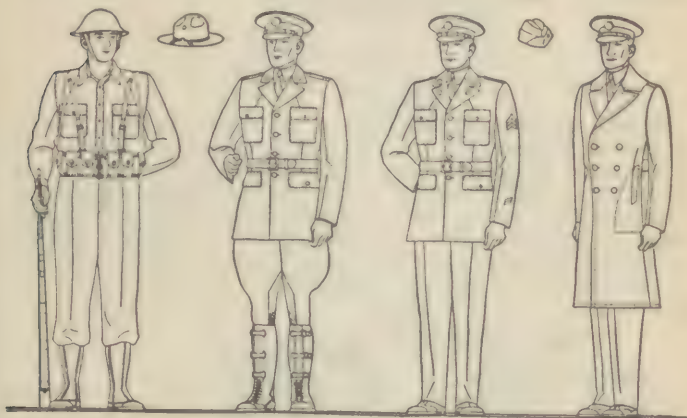


Figure 6. Uniforms for Enlisted Men.

- |                              |                                 |
|------------------------------|---------------------------------|
| ① Field service.             | ③ Garrison service, dismounted. |
| ② Garrison service, mounted. | ④ Overcoat.                     |

## EQUIPMENT

Paragraphs

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## SECTION I

## THE GAS MASK

60. The American Army service gas mask which is issued to you is the best all around military gas mask known. It is the main device for protecting your face, eyes, lungs, and throat from the effects of gases, smokes, fumes, dusts, and chemical fogs, and is made to take care of all the known chemical warfare agents. However, it will *not* protect against carbon monoxide or ammonia gas and is not suitable for use in fighting fires or in industrial accidents where ammonia gas is present.

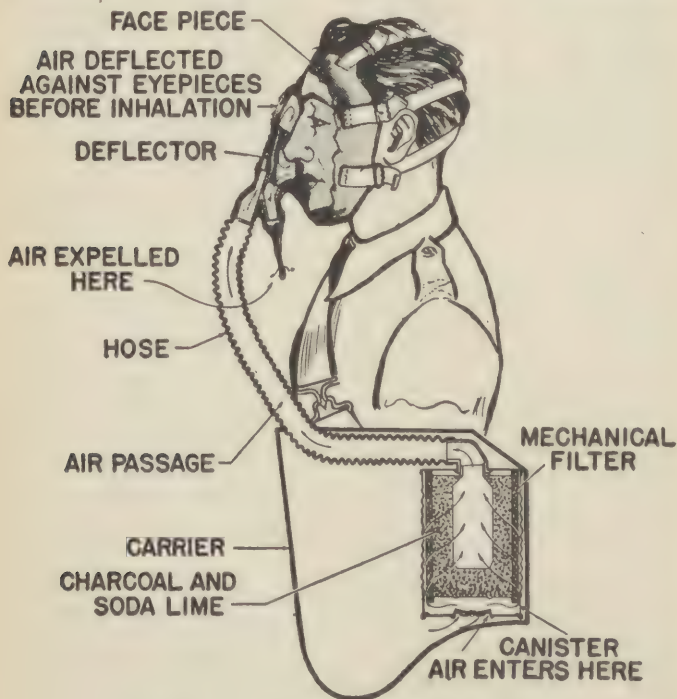
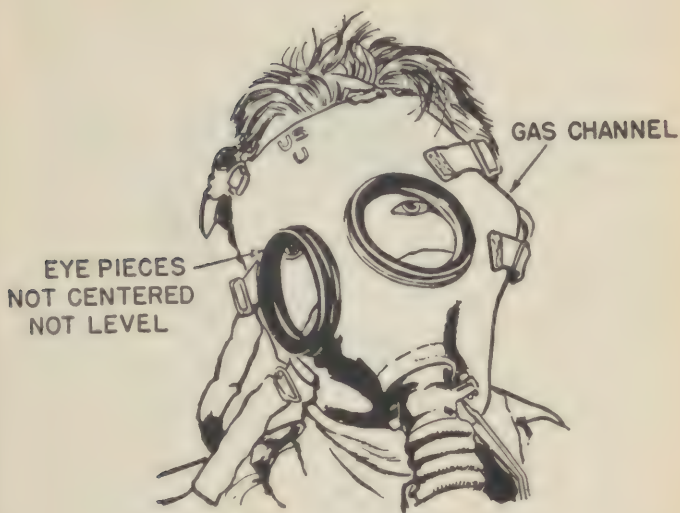


Figure 7. How Your Gas Mask Works.

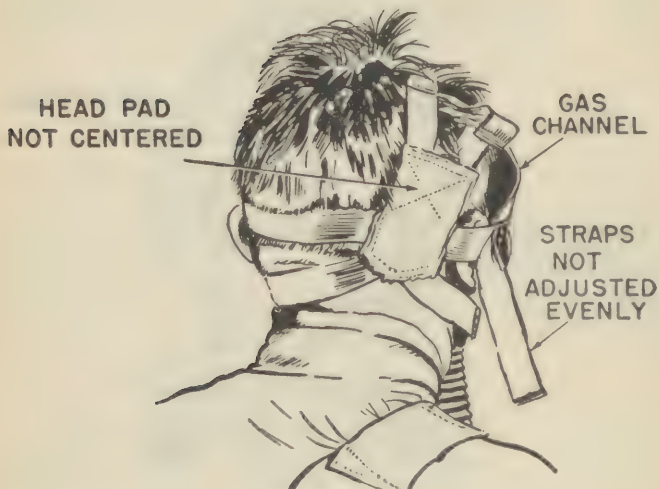


① Faulty—front view.

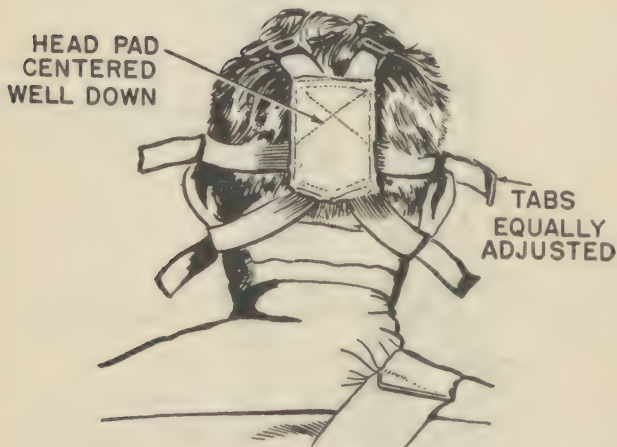


② Correct—front view.

Figure 8. Mask Adjustment.



③ Faulty—rear view.



④ Correct—rear view.

Figure 8. Mask Adjustment—Continued.

61. *a.* The gas mask consists essentially of a facepiece, a hose, and a can containing a filter. This can, called the canister, is connected by the hose to the facepiece, which fits tightly to your face. Air is drawn in through the canister, where the objectionable gases, vapors, fogs, dusts, or smokes are removed, either mechanically or by chemical action. The cleaned air then passes on to the facepiece where it is breathed and then expelled through a valve. The drawing (Figure 7) illustrates how your gas mask works.

*b.* The facepiece is made of rubber or a similar fabric and is held to your face by means of an elastic head harness. These materials may easily be damaged by carelessness and improper use. For example, if a facepiece is not properly placed in the carrier, or if it is distorted, a crease might be formed which would prevent a positive seal between the facepiece and your face. Unless the rim of the facepiece fits snugly to your face, gas-laden air may leak in. The elastic straps may also become damaged by excessive stretching.

62. Inexperienced persons often make the mistake of pulling up the head harness too tight, or of pulling up one strap more than its mate. If you adjust the harness too tightly, you will soon get a headache. If you adjust the head harness unevenly, a channel and consequent leak between the facepiece and your face is often formed. (Fig. 8.) This also often happens if you put the facepiece on carelessly.

63. The canister is the most important part of your mask, for it is here that the air is cleaned and made safe for breathing. It contains chemicals which will be damaged if water gets inside. You must always guard your gas mask canister from excess moisture.

64. You should always be careful of your gas mask. Never use it as a seat or pillow. Although it is pretty strong and rugged, it will not stand abuse. You should never carry anything but the gas mask and antidim can in the carrier. Socks, tobacco, apples, or other objects may choke up the mask, or otherwise injure it. Such objects also prevent quick removal of the facepiece from the carrier. The wise soldier quickly learns how to inspect his gas mask and makes a daily inspection of it as a matter of habit.

65. Before you become accustomed to it you may find your gas mask uncomfortable. But as you become more used to wearing it, and as you habitually train yourself to work and exercise with it properly adjusted, such discomfort disappears. It is only by wearing the mask daily and performing some sort of work, or drill, while masked that you can train your chest and lung muscles to the unaccustomed extra work and strain. You also become accustomed to your decreased ability to move and see. When adjusting the gas mask at the command *gas*, care in putting it on is more important than great speed. However, with practice, you should be able to stop breathing for 30 seconds, and in this time the mask can be securely and carefully adjusted to your face.

66. An enemy will try to attack troops who are known to be inexperienced or careless in gas mask drill and gas discipline. If he suspects that your battalion as a whole is

liable to go out without gas masks, or that it cannot do a reasonable amount of work while masked, or that it fails to post gas sentries, he will very likely make a gas attack. To beat him, you should always keep your gas mask with you, keep it in good condition, and not abuse it. You should know how to put it on, and be able to wear it for several hours at a stretch while fighting or working, and, finally, you should always be on the lookout for a gas attack.

## SECTION II

### FIELD EQUIPMENT

67. The articles of field equipment issued to you have been developed and manufactured after careful study and experiment by the War Department. You must keep them in proper condition for field service and not remove or change the finish of any article. If it becomes necessary to renew any worn surfaces your company, troop, or battery commander will explain how it is to be done and supervise the work. By following the instructions given below you will find that your equipment will always be in first class condition for inspections and field service.

68. All cloth equipment should be well brushed frequently with a stiff-bristled brush. A dry scrub brush will serve this purpose. During ordinary garrison duty it should seldom be necessary to wash the equipment. Soiled spots can usually be removed by a light local washing. During field service, equipment becomes soiled much more rapidly. Dirty equipment should be given a thorough washing, otherwise it will become insanitary and liable to rot.

69. A white soap is issued for the washing of cloth equipment, but any good grade of white laundry soap will serve the purpose. Strong soap, such as yellow kitchen soap, should never be used for washing equipment because it usually contains a large amount of free alkali and it will fade or bleach the material.

a. Before being washed, the equipment should be thoroughly brushed to remove all dust and mud.

b. Spread the belt, haversack, pack carrier, or other article on a clean board or rock and apply the soap solution with a scrub brush. After working up a good lather, wash off with clear water. A bad grease spot can ordinarily be removed by the direct application of soap with the brush, followed by a good scrubbing.

c. Always dry washed equipment in the shade. The bleaching action of the sun on damp fabric is strong. Equipment wet from a march in the rain should also be dried in the shade if practicable. Excessive fading of equipment can thus be reduced.

70. Such articles as the canteen and the different parts of the mess outfit should be kept clean. Water and food should not be kept in them longer than necessary. Aluminumware should be cleaned with soap and water, although a little sand will sometimes assist in the cleaning of canteens. Some-

times small white particles will be found in canteens which have been filled with hard water. These particles are harmless. When not actually in use, the canteen should be emptied and the cup left off to dry.

71. The knife blade is made of tempered steel and when put away for long periods should be covered with a light film of oil to prevent rust.

72. Bits, curb chains, and all metal parts issued unpainted will be oiled lightly when not in use. When in use they will be kept clean and free from rust. Removing paint from metal parts which are issued painted is prohibited except under the direction of your company, troop, or battery commander.

73. a. Leather equipment is expensive, and its proper care is important because of its value and the fact that if neglected it soon becomes unserviceable.

b. Two agents are necessary to the proper care of leather equipment—a cleaning agent and an oiling agent. The cleaning agent issued is castile or similar type soap; the oiling agents are neat's-foot oil substitute, saddle soap, and harness soap.

c. Neat's-foot oil is the most satisfactory oiling agent for leather. It penetrates the pores and saturates the fibers, making them pliable and elastic. Dry leather is brittle, but leather oiled excessively will soil the clothing and accumulate dirt.

d. Leather should be treated with enough oil to make it soft and pliable, but should not be given so much oil that it will squeeze out.

e. When leather is washed with any soap, some of the surface oil is always removed. This leaves the surface, after drying, hard and liable to crack. If this surface oil is replaced by direct application of neat's-foot oil, it is very difficult not to apply too much. This has led to the development of saddle soaps, which contain a small amount of neat's-foot oil, so that the surface of the leather after washing is not deprived of its oil.

f. Leather equipment in use should be wiped off daily with a damp cloth to remove mud, dust, or other dirt. Under no conditions should it be cleansed by immersion in water or in running water. This daily care is necessary to maintain the appearance of the equipment, but is insufficient alone to preserve it properly. At intervals of from 1 to 4 weeks, depending upon circumstances, it is essential that the equipment be thoroughly cleaned in accordance with the following instructions:

(1) Separate all parts, unbuckle straps, remove all buckles, loops, etc., where possible.

(2) Wipe off all surface dust and mud with a damp (not wet) sponge. Rinse out the sponge and make a lather by rubbing it vigorously on white soap. The sponge must not contain an excess of water if a thick lather is desired. When a creamy lather is obtained, clean each piece of equipment, taking care that no part is neglected. Each strap should be drawn its entire length through the lathered sponge to remove the dirt and sweat from the leather.

(3) Rinse the sponge again and make a thick lather with saddle soap; go over each separate piece with the same care as before.

(4) Allow the leather to become partially dry and then rub it vigorously with a soft cloth. The equipment should now have a neat, healthy appearance.

g. If the foregoing instructions have been carefully followed, the leather should now be soft and pliable and no further treatment should be necessary. At certain intervals, however, it is necessary to apply a small amount of neat's-foot oil. No general rule in regard to the frequency of oiling can be given because different conditions of climate and service have to be taken into consideration. Experience has shown that during the first few months of use a set of new equipment should be given at least two applications of neat's-foot oil per month. Thereafter need for oiling is indicated by the appearance and pliability of the leather. Frequent light applications of oil are much better than infrequent heavy applications.

h. New leather equipment should always be given a light application of neat's-foot oil before it is put into use; cleaning with soap is unnecessary because the equipment is clean.

i. Whenever leather becomes wet from any cause whatever, it should be slowly dried in the shade. Leather should never be dried in the sun or close to a radiator, fire, or other heat.

74. Soon after your equipment is issued to you, you will receive instructions from your officers and noncommissioned officers as to how the different parts should be assembled so that it can be carried or worn. The following table will help you in remembering the different items of your equipment and how they will be carried. This table includes the basic equipment common to the greater portion of our military service. Should special equipment be issued to you for particular conditions, or should you belong to an arm or service which has its own special equipment, you will receive instructions as to how it will be carried.

*Field equipment, enlisted men (other than clothing worn on person)*

Article	Dismounted	Mounted on horse (artillery drivers, see next column)	Driver, horse (ar- tillery only)	Driver, vehicle	Men mounted in vehicle*
Bag, canvas, field, with carrying strap.	On right side, slung by a strap passing over left shoulder to right side.	.....	.....	On right side, slung by a strap pass- ing over left shoulder to right side or in/on ve- hicle.	On right side, slung by a strap pass- ing over left shoulder to right side or in/on ve- hicle.
Bags, feed and grain	.....	On pommel under raincoat.	On seat of saddle, off horse, or on limber.	.....	.....
Belt, pistol, re- volver, cartridge, or magazine.	Worn	Worn	Worn	Worn	Worn.
Blankets, wool ....	In pack carrier. Carried on back or in cargo ve- hicle.	In cantle or blanket roll.	In cantle or blanket roll.	In pack carrier or in blanket roll. Carried on back or in/on vehicle. On belt, left rear or in/on vehicle.	In pack carrier or in blanket roll. Carried on back or in/on vehicle. On belt, left rear or in/on vehicle.
Canteen, cup and cover.	On belt, left rear	Slung from off (right) cantle ring, and attached to off saddlebag.	Slung from near (left) cantle ring, off horse and at- tached to saddle- bag.	.....	.....
Glasses, field ...	On right side, slung by strap passing over left shoulder.	On right side, slung by strap passing over left shoul- der.	.....	.....	On right side, slung by strap passing over left shoulder.
Handkerchiefs ....	In blanket roll	Near (left) saddle- bag.	Near (left) saddle- bag, off horse.	In blanket roll, or in saddlebag.	In blanket roll.
Haversack .....	On back, attached to belt.	.....	.....	On back, attached to belt.	On back, attached to belt.
Helmet, steel .....	Attached to rear of haversack.	Attached to near (left) saddlebag.	Attached to off (right) saddle- bag, off horse.	Attached to bag, canvas, field, near saddlebag, or to rear of haversack.	Attached to haver- sack, or bag, can- vas, field.

## Field equipment, enlisted men—Continued

Article	Dismounted	Mounted on horse (artillery drivers, see next column)	Driver, horse (ar- tillery only)	Driver, vehicle	Men mounted in vehicle*
Holster, pistol ....	Attached to belt, opposite right hip.	Attached to belt, opposite right hip.	Attached to belt, opposite right hip.	Attached to belt, opposite right hip.	Attached to belt, opposite right hip.
Horseshoes, 2 extra, with nails.	.....	In off (right) sad- dlebag.	In off (right) sad- dlebag, off horse.	.....	Attached to rear of haversack.
Intrenching tool (machete or bolo).	Attached to rear of haversack.	.....	.....	.....	.....
Kit, grooming, com- plete, and saddle soap and sponge.	.....	In off (right) sad- dlebag.	In off (right) sad- dlebag, off horse.	.....	.....
Kit, mess, complete	In haversack ....	In near (left) sad- dlebag.	In near (left) sad- dlebag, off horse.	In bag, canvas, field, in haver- sack, or in sad- dlebag.	In haversack or in bag, canvas, field.
Laces, shoe, extra..	In haversack ....	In near (left) sad- dlebag.	In near (left) sad- dlebag, off horse.	In bag, canvas, field, in haver- sack, or in left saddlebag.	In haversack or in bag, canvas, field.
Mask, gas, horse..	.....	Strapped to halter under throat latch.	Strapped to halter under throat latch.	.....	.....
Mask, gas, service..	Slung under left arm by strap passing over right shoulder.	Slung under left arm by strap passing over right shoulder.	Slung under left arm by strap passing over right shoulder.	Slung under left arm by strap passing over right shoulder.	Slung under left arm by strap passing over right shoulder.
Overcoat .....	Attached to haver- sack.	Strapped to pom- mel over feed bag.	Strapped a cross seat of saddle, off horse.	Attached to haver- sack, to bag, can- vas, field, or in/ on vehicle.	Attached to haver- sack, to bag, can- vas, field, or in/ on vehicle.
Pocket, magazine, web, double.	Left front of belt	Left front of belt..	Left front of belt..	Left front of belt..	Left front of belt.
Pouch, first-aid packet.	Right rear of belt	Right rear of belt	Right rear of belt	Right rear of belt	Right rear of belt.

\*Alternative methods for carrying equipment of men mounted in vehicles are prescribed for the reason that types of vehicles, nature and lengths of march, etc., vary so greatly that the description of only one method for one vehicle will not suffice.

Article	Dismounted	Mounted on horse (artillery drivers, see next column)	Driver, horse (ar- tillery only)	Driver, vehicle	Men mounted in vehicle*
Raincoat .....	In haversack ....	Attached to pom- mel over feed bag.	Strapped across seat of saddle, off horse.	In haversack, in bag, canvas, field, or in/on vehicle.	In haversack, in bag, canvas, field, or in/on vehicle.
Rations .....	In haversack ....	Distributed be- tween the two saddlebags to bal- ance load.	Distributed be- tween the two saddlebags of horse to balance load.	In haversack, in bag, canvas, field, or in saddlebags.	In haversack or in bag, canvas, field.
Saddlebags, pair ..	.....	On bars of saddle in rear of cantle.	Across seat off sad- dle or on bars of saddle in rear of cantle, off horse.	Motorcyclists—in rear of seat.	Attached to left side of haver- sack.
Scabbard, bayonet	Attached to left side of haver- sack.	.....	.....	.....	.....
Scabbard, rifle ....	.....	Attached to near (left) side of sad- dle, under skirt.	.....	Attached to vehicle	.....
Set, toilet .....	In haversack ....	In near (left) sad- dlebag.	In near (left) sad- dlebag, off horse.	In blanket roll or in saddlebag.	In blanket roll.
Socks, pair .....	In blanket roll ..	In near (left) sad- dlebag.	In near (left) sad- dlebag, off horse.	In blanket roll or in saddlebag.	In blanket roll.
Surcingle .....	.....	In off (right) sad- dlebag, or over saddle blanket.	Attached, one to each saddlebag, off horse.	.....	.....
Suspenders .....	.....	Attached to belt ..	Attached to belt ..	Attached to belt ..	Attached to belt.
Tag, identification, with tape .....	Around neck, un- der shirt.	Around neck, un- der shirt.	Around neck, un- der shirt.	Around neck, un- der shirt.	Around neck, under shirt.
Tent, shelter half, complete with pole, rope, and pins.	In pack carrier, carried on back, or in vehicle.	Covering (pole, rope, and pins within) blanket roll, on cantle or in/on vehicle.	Covering (pole, rope, and pins within) blanket roll, carried on seat of saddle, off horse or on lim- ber.	Covering (pole, rope, and pins within) blanket roll, carried in/on vehicle.	Covering (pole, rope, and pins within) blanket roll, carried on back or in/on ve- hicle.

\*Alternative methods for carrying equipment of men mounted in vehicles are prescribed for the reason that types of vehicles, nature and lengths of march, etc., vary so greatly that the description of only one method for one vehicle will not suffice.

*Field equipment, enlisted men—Continued*

Article	Dismounted	Mounted on horse (artillery drivers, see next column)	Driver, horse (ar- tillery only)	Driver, vehicle	Men mounted in vehicle*
Towel, face .....	In haversack ....	In near (left) sad- dlebag.	In near (left) sad- dlebag, off horse.	In haversack, in bag, canvas, field, or in saddlebag.	In haversack or in bag, canvas, field.
Trumpet .....	Suspended on right side by strap passing over left shoulder.	Suspended on right side by strap passing over left shoulder.	.....	.....	Suspended on right side by strap passing over left shoulder.
Underclothing ....	In blanket roll. Carried on back or in cargo vehicle.	In near (left) sad- dlebag, or blanket roll.	In near (left) sad- dlebag, off horse, or in blanket roll.	In blanket roll, in bag, canvas, field, or in saddlebag.	In blanket roll. Carried on back or in cargo vehicle.
Whistle (chain, hooked to left shoulder loop buttonhole).	In left pocket, shirt or coat.	In left pocket, shirt or coat.	In left pocket, shirt or coat.	In left pocket, shirt or coat.	In left pocket, shirt or coat.

\*Alternative methods for carrying equipment of men mounted in vehicles are prescribed for the reason that types of vehicles, nature and lengths of march, etc., vary so greatly that the description of only one method for one vehicle will not suffice.

## SECTION III

## THE MEDICAL SOLDIER'S FIELD EQUIPMENT

**75. Method of Assembling Haversack and Pack Carrier.**  
*a. To adjust the pistol belt.* Take the belt and adjust it so that it fits loosely around the waist and when buckled rests well down over the hip bones and below the pit of the abdomen. The belt is put on with the male buckle on the right. Place the belt on the ground in front of you, inner side down and male buckle to your right.



Figure 9. Pistol Belt.

(1) *To attach first aid pouch.* Attach the first aid pouch by engaging the double hook attachment in 5th and 6th eyelets from your right.

Insert hooks from under side.

Place the first aid packet in the pouch with the tab or ring down and secure the flaps.

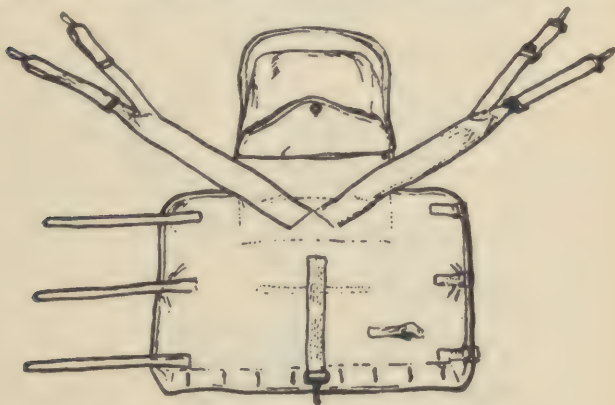
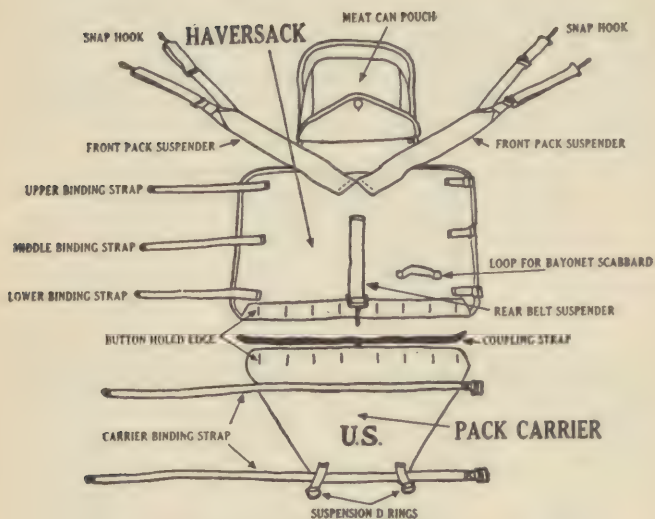


Figure 10. Haversack Without Pack Carrier.

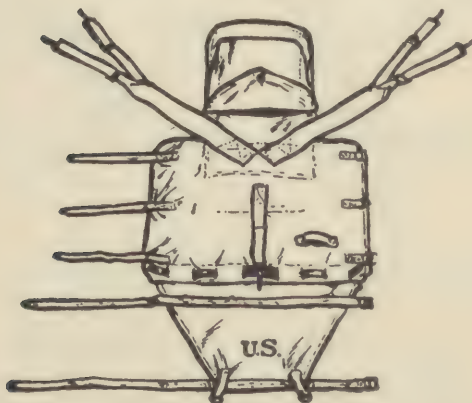
(2) *To attach canteen cover.* Attach the canteen cover by engaging the double hook attachment in the 5th and 6th eyelets from your left. Insert hooks from under side.

Place the canteen and cup into the canteen cover with concave side down and secure the flaps. Place the assembled belt on the ground on your right.

*b. To attach pack carrier to haversack.* (1) Spread the haversack on the ground in front of you, inner side down, outer flap and meat can pouch to the front. Place button-



① Before joining (outside view).



② After joining (outside view).

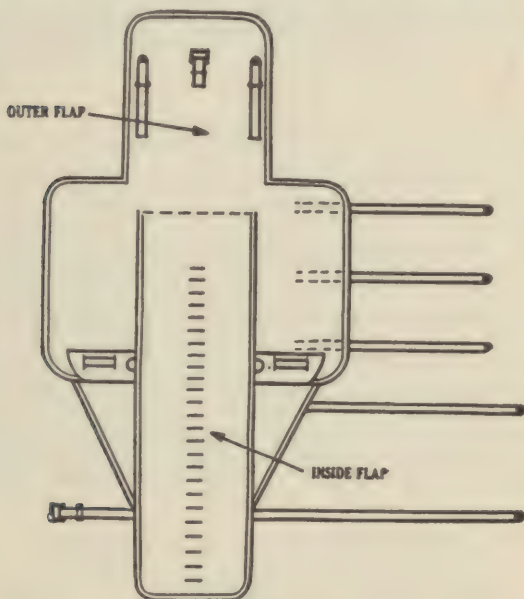
Figure 11. Haversack and Pack Carrier.

hole edge of pack carrier, lettered side of pack carrier up, under the buttonholed edge of the haversack. Superimpose buttonholes of haversack upon corresponding ones of pack carrier. Insert the lock strap through the horizontal buttonhole of the pack carrier and lock in place.

Lace the pack carrier to haversack by passing the ends of coupling strap down through corresponding buttonholes of haversack and pack carrier nearest the center, bringing the ends up through next buttonholes and continuing to the right and left, respectively, to the sides.

(2) *To attach hand axe carrier.* Pass hand axe carrier underneath meat can pouch and engage double hook attachment in eyelets in flap provided, inserting hooks from under side.

Place the hand axe in the carrier and secure the flap.



(3) Inside view.

Figure 11. Haversack and Pack Carrier—Continued.

(3) *Mess kit.* Place the knife, fork and spoon in the meat can. Place the lid on the meat can with the ring toward the hinge. Press the lid down firmly. Fix the lid with the handle, place the meat can in the pouch, and button the flap. (Note—The knife, fork, and spoon may be carried separately in the canvas pockets within the meat can pouch.)

c. *To attach haversack to pistol belt.* (Note—If the medical kit is to be worn, proceed as shown in par. 76, b to f, inclusive, before slinging the infantry pack. Do not attach the haver-

sack to the pistol belt.) Place the belt along junction of haversack and pack carrier, canteen cover and first aid pouch down, male buckle to the left. Insert hook attached to rear belt suspender in the centermost upper eyelet so that the point of the hook will be on the outside of the belt. Fold ends of pistol belt to the center. Fold the belt suspenders toward the respective ends of the belt. Hook the inside suspender straps from the inside of the belt out, into the upper third eyelets from the male and female buckles of the belt.

Turn equipment over, keeping hand axe to front. Spread the inner flap smoothly over the pack carrier.

*d. To pack the haversack.* Place the rations in the center of haversack in front of and touching line of attachment of inside flap. Place toilet articles in front of rations. Fold the inside of haversack over and under these articles. Fold sides of haversack over rations and toilet articles.

Pass upper two haversack binding straps through loops on inner flap opposite point of attachment of the strap to haversack body. Fasten each strap by passing end of strap through the buckle opposite it, first through the opening next to the buckle attachment, then over the center bar and back through the opening of buckle away from its attachment. Pull strap tight and make fastening secure.

The haversack is now packed and the carrier is ready for the reception of the roll.

When rations are not carried, roll toilet articles and extra clothing and equipment in ration space so that top of toilet articles will be on line with top of haversack body.

Lay the lower haversack strap over the toilet articles.

*e. To make the roll.* (1) *Shelter half.* Spread shelter half on the ground, triangular end to your right, with buttons up.

Fold the triangular end over the body of the shelter half so that the shelter half forms a rectangle. Make a second fold by carrying folded edge to opposite edge.

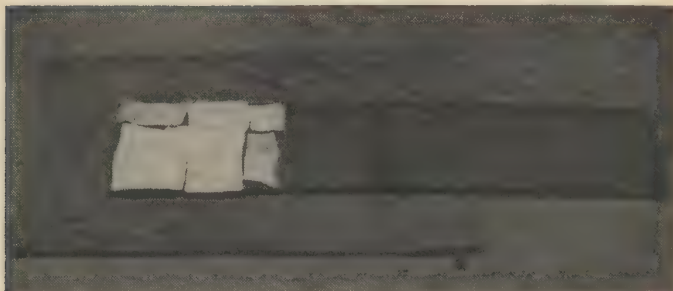
(2) *The blanket.* Fold the blanket twice parallel to its longer axis so that the blanket is now one-fourth its previous width; then fold at the middle so as to bring the ends together.

Place the blanket symmetrically in center of folded shelter half with the folded end toward the buttons.

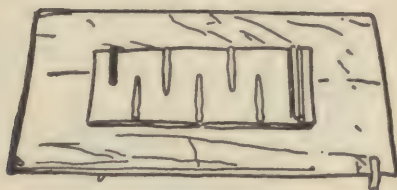
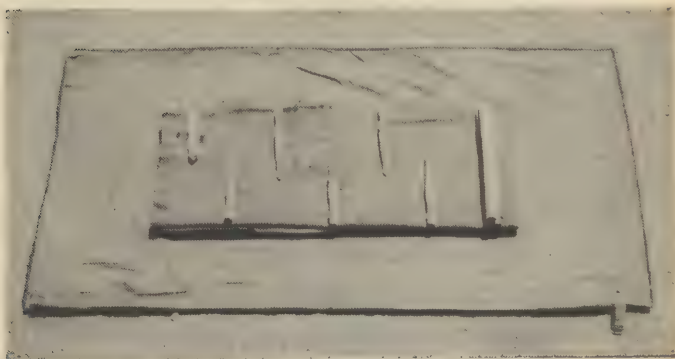
Place underwear, socks, and handkerchief between the folds of the blanket.

Place tent pole on the folded end of the blanket and spread the five pins alternately along opposite edges of the blanket with points of the pins toward the center of the blanket. (An alternate method is to place the pins next to and parallel to the pole.) The tent rope is placed at the opposite end from the pole. (If the overcoat is carried, the tent rope is kept out and used for the purpose of attachment.)

Fold sides and then the near end of shelter half snugly over the blanket; fold 10 inches of far end of shelter half toward the blanket and, beginning at near end, roll tightly into folded end of shelter half, thus making an envelope roll.

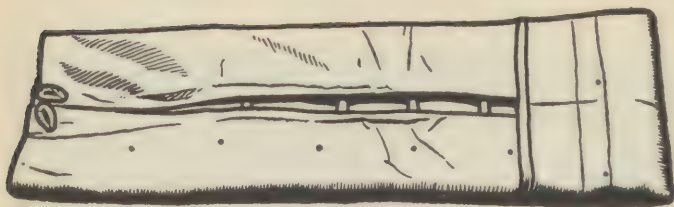


① First step.



② Second step.

Figure 12. To Make the Roll.

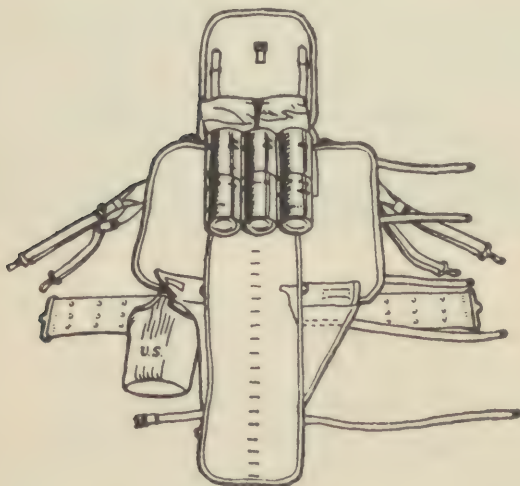


③ Third step.



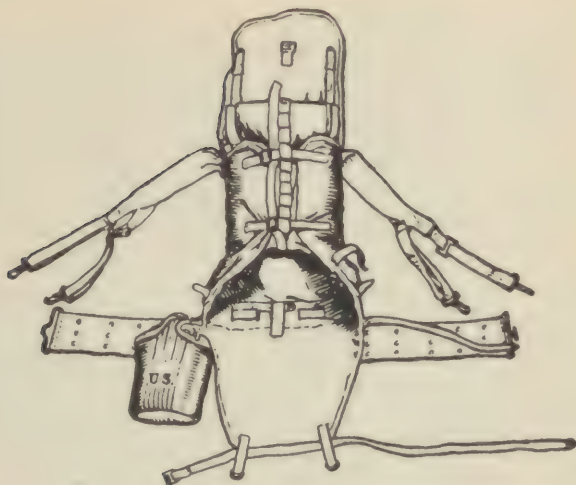
④ Completed roll.

Figure 12. To Make the Roll—Continued



① First step.

Figure 13. To Pack the Haversack.



② Second step.

Figure 13. To Pack the Haversack—Continued.

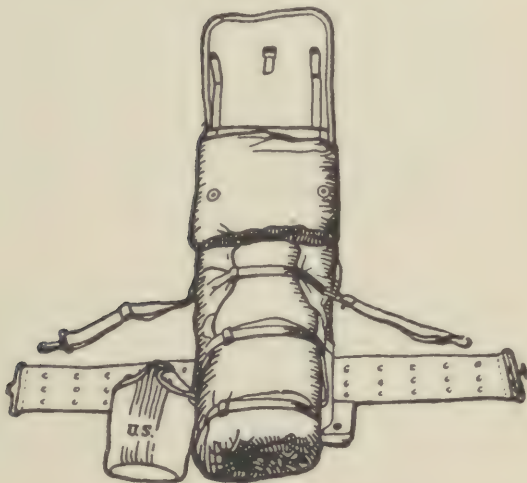


Figure 14. Pack Assembled.

f. *To assemble the pack.* Place the roll in pack carrier and haversack with one end against bottom of packed haversack and with the seam down.

Grasp lower suspension rings, one in each hand. Place right knee against bottom of roll. Pull carrier down and force the roll up close against bottom of packed haversack.

Without removing the knee, fasten lower pack carrier binding strap over the roll and secure it by passing, from below, its end up through the opening of its corresponding buckle next to the buckle attachment, then over center bar and down through opening of the buckle away from the buckle attachment. Place the lower haversack strap (inner flap strap) over the roll.

In a similar manner secure lower haversack binding strap.



① First step.

Figure 15. To Fold the Overcoat.

g. *To fold and attach the raincoat.* Button the raincoat. Spread it on the ground with the buttons down. Fold in the sides and sleeves so the width will be approximately  $8\frac{1}{2}$  inches, then fold it in half, bringing the ends together. Now fold it in half again, forming a rectangle of approximately  $8\frac{1}{2}$  inches by  $10\frac{1}{2}$  inches. Place the raincoat between the inner and outer haversack flaps. Secure it with lower haversack strap by fastening it tightly to the buckle on under side of outer haversack flap.

Secure the axe by passing the upper pack carrier binding strap over the handle and fastening it into its buckle.

Engage snap hooks on pack suspenders in suspension rings.

In order to obtain the maximum benefit from the shoulder



② Second step.



③ Completed fold.

Figure 15. To Fold the Overcoat—Continued.

loops when the pack is suspended on the back, the pack should be so assembled that when the roll is carried, the length of the assembled haversack and pack carrier will be at least 27 inches.

*h. To fold and attach the overcoat.* Turn sleeves inside out, place overcoat on the ground, outside down, coat smooth, collar extended, sleeves smooth and extended toward pockets; move inside flap of tail under outside flap about 6 inches and gather the slack in the coat thus caused in one fold along middle seam, tapering toward the collar.

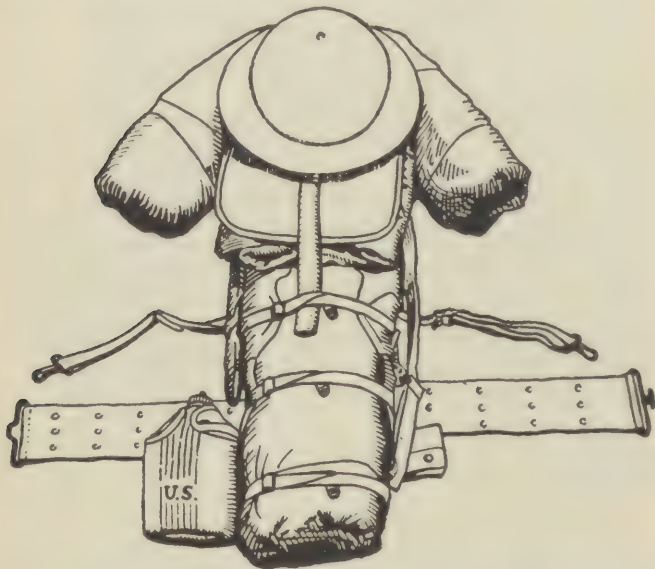


Figure 16. Full Equipment With Overcoat and Raincoat.

Fold bottom of front edges of coat about 12 inches toward center seam, forming an approximate parallelogram, the side of which across the coat will be 42 inches. Fold collar end down about 15 inches at the top and roll smoothly and tightly toward the tail; turn tail up to a depth of about 9 inches, and roll entire coat into this pocket.

Place the overcoat thus rolled, open side of roll down, on top of haversack, so that the center back seam is over center of top of haversack.

Secure coat at the top with a shelter half rope. Bind the ends of overcoat down and along the sides of haversack. Lash the ends of roll to haversack with the rope, using a half hitch near each end of overcoat and passing the rope around haversack over outside flap.

*i. To attach the helmet.* Attach and secure the helmet by placing chin strap over meat can pouch.



Figure 17. Individual Medical Equipment (Less Infantry Pack).

j. *To adjust full equipment.* Put on equipment, slipping the arm through pack suspenders as through sleeves of a coat.

By means of adjusting buckles on belt suspenders, raise or lower the belt until it rests well down over hip bones and below pit of abdomen.

Raise or lower it in rear until adjusting strap lies smoothly across small of back. By means of adjusting straps on back suspenders, raise or lower the load on the back until the top of haversack is level with top of shoulders, so that pack suspenders from their point of attachment on the haversack to the shoulders will be horizontal.

The latter is essential to proper adjustment of the load.

k. *To discard the roll without removing equipment from the body.* Unsnap pack suspenders from suspension rings and snap them into eyelets to the right and left of rear suspender hook.

Support bottom of pack with left hand and with right hand grasp coupling strap at its middle and withdraw first one side and then the other.

Pull down on the roll with both hands and remove it.

#### **76. Assembly and Adjustment of the Medical Private's Kit.**

a. *General.* The medical private's kit consists of a suspender, two canvas pouches, two cantle ring straps, and two litter-carrying straps.

The kit suspender is designed to carry the pouches which are attached to the suspender by snaps; it also acts as a yoke, distributing equally the weight of the loaded litter when the litter-carrying straps are used.

The canvas pouches are designed to carry the first aid equipment of the medical soldier. Each pouch has a false bottom which can be extended, thereby doubling its capacity.

The cantle ring straps are used to adjust the spacing between the pouches at the rear when the pouches are attached to the suspender; to act as hand-carrying straps for the pouch when it is not attached to the suspender and to secure the pouch to the cantle ring of the standard saddle when in use by mounted troops.

The litter-carrying straps are used to replace the slings on the standard litter and as a shoulder strap when only one pouch is used.

The canvas pouches contain the following items of first aid equipment:

##### **(1) Right hand pouch.**

- 1 Ammonia flask with cup.
- 1 Metal container for 12 iodine swabs.
- 1 Kit insert for ammonia flask and metal container.
- 3 Triangular bandages.
- 1 Spool 1" adhesive plaster.
- 2 Cards of safety pins.
- 1 Bandage scissors.
- 12 3" compressed gauze bandages.
- 12 Iodine swabs.
- 2 Ounces of aromatic spirits of ammonia.

(2) *Left hand pouch.*

1 Pencil.

8 Small first aid packets.

2 Litter-carrying straps.

1 Book of emergency medical tags.

b. Attach the pistol belt around the waist. Place the medical kit suspender on the shoulder with the wide sections to the rear.

c. Suspend the pouches by snapping the pouch rings to the front and rear suspender on each side. The pouch containing the ammonia bottle is hooked on the right side. The latch strap on the pouch should face to the front.

d. Hook the snap on the front of the pouch to the ring on the front of the opposite pouch. When the conformation of the individual requires it, a wider frontal adjustment of the pouches may be obtained by fastening the snaps on each pouch together.



Figure 18. Full Equipment (Less Overcoat and Gas Mask).

e. One cantle ring strap is used in the rear adjustment of the pouches. It is fastened to the rings at the back of each pouch. The equipment is properly adjusted when it affords the maximum comfort in use.

f. The suspender straps are then adjusted so that the pouches will hang horizontally about waist high and as far as possible to the front.

g. The infantry pack is then put on. The two hooks on the ends of front belt suspenders that are used to attach to the pistol or rifle belt are now snapped to the forward rings of the two pouches. The rear belt suspender is not used but

should be adjusted so that it will not cause discomfort. (Note—The two hooks on the ends of front belt suspenders may be attached to the third upper eyelets on each side of the pistol belt.)

*h.* When a long litter carry is anticipated, the infantry pack should be removed. The pouches may be discarded temporarily and the litter straps attached to the suspender. The cantle ring strap used for rear adjustment should then be attached to the front of the suspender and used as a breast strap, or the front supporting straps of the suspender may be attached to the opposite ends of the suspender.

## SECTION IV

### PACKING INDIVIDUAL EQUIPMENT ON HORSE

77. The method of packing your saddle is very important in keeping your mount in top condition and able to withstand hard work. You must distribute the weight evenly on your horse's back. Pressure resulting from an uneven distribution of arms and equipment may result in sores or cause injury to its withers and back. Consequently, *balance* the weight of articles attached to one side of the saddle as nearly as possible by the weight of articles attached to the other side. Weight is carried better by the pommel than by the cantle.

78. *a.* In this paragraph the method of packing individual equipment on horse is described and illustrated.

*b.* *To assemble and pack the cantle or blanket roll.* (1) The shelter tent half is spread flat on the ground, buttons up. The triangular flap is folded over shelter tent half, making the latter a rectangle. The blanket is folded once through the center, parallel to short side, and again through the center perpendicular to short sides. The blanket is then laid on shelter tent half, the longer folded edge parallel to and 1 inch from long side of shelter tent half, opposite the buttons, the shorter folded edge toward triangular flap, the blanket equidistant from ends of shelter tent half.

(2) The tent pole, folded, is inserted in double fold of blanket, end of pole flush with shorter folded edges, the pole parallel to and fitting snugly into the double fold. The tent pins are inserted in double fold of blanket, near loose edges, placed alternately head and point and overlapping each other so as to occupy about the same space as the tent pole, the pins parallel to and fitting snugly into double fold of blanket. This leaves a "break" at center of completed roll which allows it to fit the saddle.

(3) The free ends of shelter tent half are folded over corresponding portions of the blanket, the ends of shelter half throughout their length being parallel to its center line. As a prevention against the ends of completed roll pulling out, the free (loop) end of tent rope is passed several times through tent pin loops on the two opposite corners of button side of shelter tent half, stretched flat, and tied with a single bow-knot. The button side of roll is folded back about 6

inches (as far as second button) in order to form a pocket when roll is completed, edge of pocket being parallel to edge of blanket.

(4) Using the hands and knees, the blanket and shelter tent half are rolled tightly from side opposite buttons into pocket at button side, making a tightly bound roll. The roll is then "broken" or curved to fit the cantle of saddle, with free edge of pocket uppermost and to the rear, so that this edge fits snugly against the roll and prevents entrance of rain or snow when roll is on the saddle. It is advisable for two men to work together in making up the roll.

c. *To fold the raincoat or overcoat.* The raincoat, inside out, with collar extended is folded once lengthwise. It is rolled tightly from folded edge toward buttons, making length of roll the same as full length of garment. If the overcoat is carried, it is rolled in the same manner as the raincoat.



① Near side.

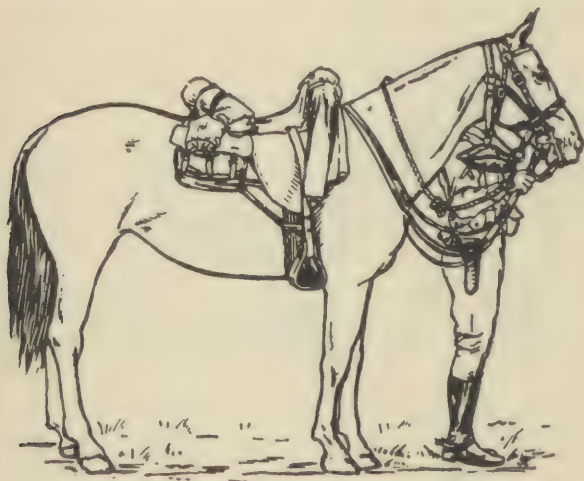
Figure 19. Saddle, Packed.

d. *Feed and grain bag.* The grain bag, with or without grain, is secured inside the feed bag.

e. *To pack the saddle* (fig. 19.) (1) The saddle, off the horse, is placed on the ground or otherwise as is most convenient for packing. The saddlebags are placed on the cantle and secured thereto by the attachments provided. The cantle roll is strapped to the cantle by means of the cantle straps which are wrapped three times around the roll. The straps

are securely buckled and the loose ends, falling to the front, are tucked under the straps. The buckles should be far enough to the rear to prevent injury or discomfort to the trooper. The ends of the roll are pressed forward and down toward the saddlebags. The two outside straps should pass over the roll well down toward its ends in order to keep the roll curved to the shape of the cantle.

(2) The feed bag and grain bag are strapped on top of the pommel bar (under the raincoat or overcoat), regardless of whether grain is carried. The loose ends of the straps, falling to the rear, are tucked under the straps. The raincoat, and/or overcoat, collar to the left, is placed on top of feed and grain bag and strapped on by means of the pommel straps. The ends of the roll are pressed in toward the horse's shoulders. All buckles should be far enough forward to prevent injury or discomfort to the trooper.



② Off side.

Figure 19. Saddle, Packed—Continued.

(3) The canteen and cup, in their cover, are snapped to the right cantle ring. The cover is fastened tight to the saddlebag by buckling the two rear saddlebag cover straps over the canteen cover strap where it passes under the bottom of the canteen cover.

(4) Attach helmet to near (left) saddlebag by buckling the three straps of saddlebag flap through the chin strap.

(5) The rifle scabbard is secured to left side of saddle, attached to the pommel ring by the upper strap of scabbard and to cantle ring by lower strap. Both straps are so adjusted that the scabbard will hang at an angle of  $30^\circ$  with the vertical. The rifle is not inserted in the scabbard until after the horse is saddled.

(6) Wherever possible, two men work together in placing the packed saddle on the horse's back. In case only one man is available, it may be found advisable to attach saddlebags, canteen, cup and cover, and rifle scabbard after the horse has been saddled.

f. *Drivers (artillery)*. (1) *General*. In order to equalize loads on the two horses, certain articles, as prescribed by the table shown in paragraph 74, may be placed on saddle of the off horse instead of on riding horse.

(2) *To pack feed bags*. To pack feed bags, fill the grain bags; tie mouths securely and place a filled grain bag in each feed bag, mouths of grain bags down. Roll feed bags, securing closed ends by means of web straps at ends of feed bags. The snap ends of the straps are either snapped in the rings on feed bags or tucked under turns in straps. The open ends of the two feed bags are closely secured together to prevent lower ends from rubbing against traces. When grain is not carried, fold empty grain bags and place them inside feed bags. Roll feed bags along their longer edges and secure as above.

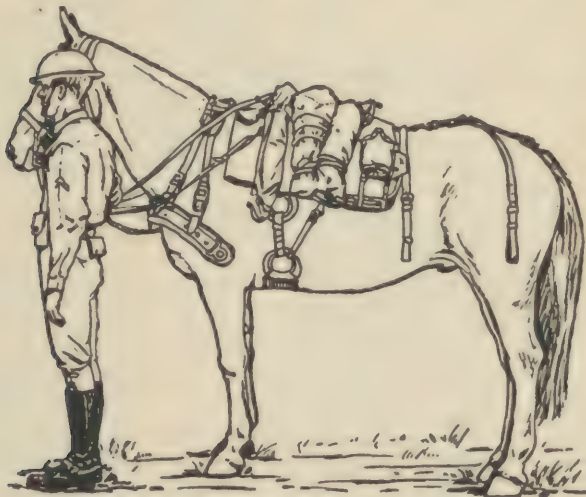


Figure 20. Driver's (Artillery) Off Horse.

(3) *To pack saddle*. To pack the saddle of the off horse, the near stirrup being passed over seat of saddle, the procedure is as follows:

(a) The saddlebags are placed on cantle and secured by attachments provided.

(b) Place surcingles under straps of saddlebag flaps above the loops in saddlebag flaps through which the straps pass.

(c) Attach mounted canteen cover to left rear cantle ring by the snap of canteen strap.

(d) Attach helmet to off (right) saddlebag by buckling the three straps of saddlebag flap through the chin strap.

(e) Extend center cantle strap. Place roll on top of buckle end of cantle strap in the center of seat of saddle so that open edge will be down. Place the two feed bags, secured together at their open ends, across seat of saddle in front of roll. Bring tongue end of cantle strap to the front over center of roll and junction of the two feed bags; take one turn around the junction of the two feed bags; pass strap to rear under roll, bring it forward over center of roll, and buckle it. Each coat strap is passed under rear quarter strap and once around feed bag about 4 inches from the lower end, punching a throat in feed bag to prevent strap from slipping; pass each strap to rear and once around roll about 6 inches from end of roll; bring strap from under roll, over itself at the interval between feed bags, roll and buckle. The ends of roll are drawn close to ends of feed bags before being secured. The coat straps are attached to saddlebag side—strap rings about saddlebag side straps to avoid twisting the rings.

(f) Place overcoat, collar to the left, across seat of saddle in front of feed bags and secure by two pommel coat straps. When raincoat and overcoat are both carried, place raincoat on top of overcoat. When overcoat is not carried, raincoat is packed as provided for overcoat. (See Fig. 20.)

(4) *To pack saddle of the off horse when blanket rolls and feed bags are carried on limber.* To pack the saddle of the off horse, the near stirrup being passed over seat of saddle, the procedure is as follows:

(a) Place the saddlebags on the seat of the saddle and secure them by passing the saddlebag straps through the cinch rings and drawing them tight.

(b) Place the overcoat on top of the saddlebags, collar to the left; place the raincoat on top of the overcoat. Take a couple of turns with the middle cantle strap around the two coats. Then take several turns around each end of the coats, using a coat strap on each end. Place the free end of each strap through the cinch ring on each side and pull the coats down firmly against the saddle.

(c) Secure end of halter tie rope of off horse to off pommel ring of off saddle, and that of near horse to near pommel ring of near saddle.

## SECTION V

### DISPLAY OF EQUIPMENT

79. a. You will attend inspections at which you will be required to display your field equipment. At these inspections your officers will check your field equipment to see that no items are missing and that all items are clean and in condition for immediate field service. Figure 21 shows how your equipment should be displayed if you are a dismounted medical soldier or equipped with a haversack and pack carrier.

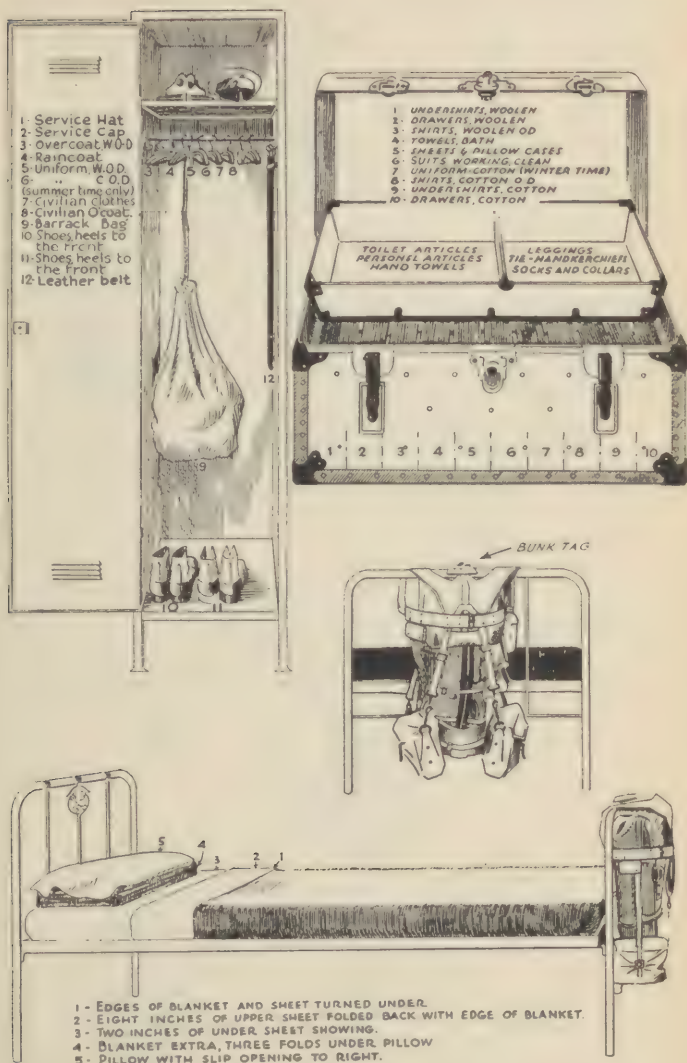


Figure 21. Arrangement of Equipment in the Squad Room.

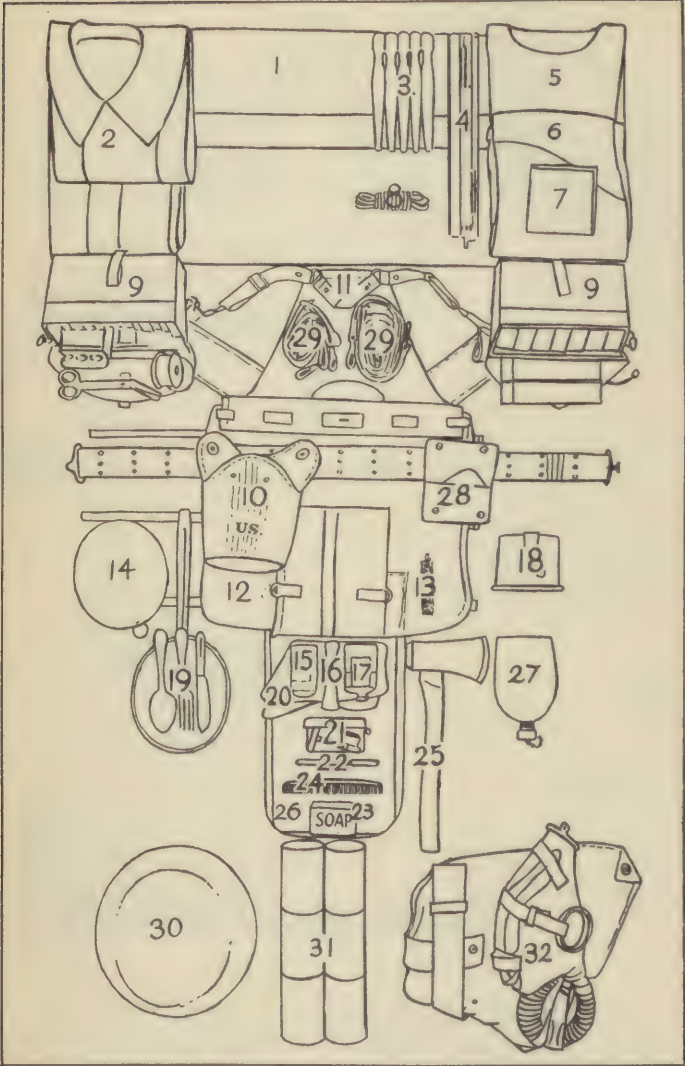


Figure 22. Display of Equipment, Medical Soldier.

b. Figure 21 shows how your equipment should be arranged in the squad room. If a comfort has been issued to you, it should be rolled neatly and placed at the foot of the bed.

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**Legend, Figure 22.**

1. Shelterhalf and blanket.
2. Raincoat, 8½" x 10" folded flush to edges of shelterhalf.
3. Tent pins; begin 1" from pole.
4. Tent pole; end with nail toward inspecting officer.
5. Shirt; flush to edges of shelterhalf.
6. Drawers; half over shirt.
7. Handkerchief; to bottom edge and center of drawers.
8. Tent rope; 3" from pins, 1" from pole.
9. Instrument case and medical pouches; flaps underneath, tags and pencil pulled up.
10. Canteen pouch.
11. Medical suspender; no space between suspender and shelterhalf.
12. Haversack; no space between it and suspender flaps.
13. Shoe laces; 1" from edges.
14. Meat can cover; 1" from handle.
15. Shaving stick.
16. Shaving brush.
17. Toothpowder.
18. Canteen cup; line up with the outer edge of middle buckle and edge of canteen 1" from edge of haversack.
19. Meat can, knife, fork, and spoon, "U. S." up, handle 1" from edge of haversack.
20. Socks, heels to left of inspector, bottom of sock toward him, toes apart.
21. Razor; handle to the right.
22. Toothbrush; bristles up.
23. Soap.
24. Comb.
25. Handaxe; flush with edges of toilet roll and haversack.
26. Towel; fold extends to edge of haversack only.
27. Canteen, line up with edge of haversack and edge of meat can, 1" from edge of handaxe.
28. Web belt, first aid pouch.
29. Two cante and packet straps and 2 litter carrying straps.
30. Helmet.
31. Field ration.
32. Gas mask.

## CHAPTER 7

### SCHOOL OF THE SOLDIER WITHOUT ARMS (DISMOUNTED)

	Paragraphs
Section I. Positions .....	80-84
Section II. Steps and marchings .....	85-96

#### SECTION I

#### POSITIONS

**80. Position of the Soldier, or of Attention (Fig. 23).** To take the position of attention place your heels together and on the same line. Allow your feet to turn out equally, forming an angle of  $45^{\circ}$  with each other. Keep your knees straight but without stiffness. Draw your hips up under your body slightly. Keep your chest up and your shoulders back. Do not allow one shoulder to be higher than the other. Keep your arms straight without stiffness, and hanging at your sides, in such a way that your thumbs are always along the seams of your trousers. Turn the backs of your hands out away from your body and allow your hands and fingers to cup naturally. Always keep your eyes straight to the front. When standing properly the weight of your body will be divided equally between the heels and balls of both feet. When assuming the position of attention, bring your heels together smartly and audibly.

**81. Rests.** Being at the halt the commands are: FALL OUT; REST; AT EASE; and 1. PARADE, 2. REST.

a. At the command FALL OUT, you may leave your position in ranks but must remain in the immediate vicinity. At the command FALL IN, resume your position in ranks and stand at attention. When on the march, you fall in AT EASE unless you were at attention when the command FALL OUT was given.

b. While at rest it is required that you keep one foot in place in ranks. At the command REST, except for keeping one foot in place, you may move around and talk.

c. At the command AT EASE, you are authorized to move around but must keep your right foot in place in ranks. Silence is always maintained while at ease.

d. PARADE REST is a movement that is executed in unison by all soldiers in ranks. At the command of execution (REST) of 1. PARADE, 2. REST, move your left foot smartly 12 inches to the left of your right foot. As at attention, your knees are kept straight without stiffness, and the weight of your body rests equally on both feet. At the same time your foot is moved, clasp your hands behind your back, palms to the rear, the thumb and fingers of your right hand clasping your left thumb. As at attention, you are required to maintain both silence and immobility.

e. Being at any of the rests, except FALL OUT, you resume the position of attention at the command of execution (ATTENTION) of 1. SQUAD, 2. ATTENTION.

**82. Eyes Right or Left.** The commands are: 1. EYES 2. RIGHT (LEFT), 3. READY, 4. FRONT.

a. At the command **RIGHT**, turn your head and eyes to the right.

b. At the command **LEFT**, turn your head and eyes to the left.

c. At the command **FRONT**, turn your head and eyes to the front.

**83. Facings.** All facings are executed from the halt and in the cadence of quick time. The commands are: 1. **RIGHT (LEFT)**, 2. **FACE**; and 1. **ABOUT**, 2. **FACE**.

a. At the command **FACE** of 1. **RIGHT**, 2. **FACE**, slightly raise your left heel and your right toe; turn  $90^\circ$  to the right by pivoting on the right heel. This movement is assisted by pushing slightly with the ball of your left foot. Hold your left leg straight without stiffness. The second part of this movement consists in placing your left foot alongside of your right and assuming the position of attention.

b. At the command **FACE** of 1. **LEFT**, 2. **FACE**, you execute the above movement in a corresponding manner to the left and on your left heel.

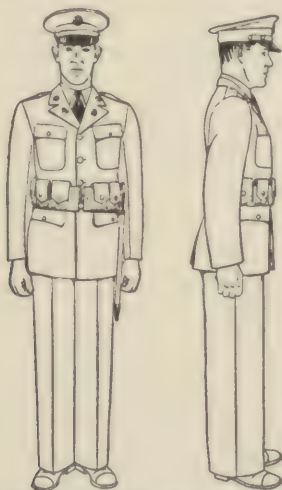


Figure 23. Position of the Soldier, or of Attention.

c. At the command **FACE** of 1. **ABOUT**, 2. **FACE**, place the toe of your right foot a half-foot length in rear and slightly to the left of your left heel. Do not move your left foot. Keep the weight of your body mainly on your left heel. Keep your right leg straight without stiffness. The second part of this movement consists in turning your body  $180^\circ$  to the right on your left heel and the ball of your right foot. Now place your right heel beside your left. If you do this movement properly you will find you have turned exactly  $180^\circ$  and your heels come together on the same line without the necessity of moving either foot forward or backward.

**84. Salute With the Hand (Fig. 24).** a. The commands are:

1. HAND, 2. SALUTE. At the command SALUTE, raise your right hand smartly until the tip of your forefinger (index finger) touches the brim of your headdress, above and slightly to the right of your right eye. If you are without cap or hat, the tip of your forefinger touches your forehead above and slightly to the right of your right eye. In either case you keep your thumbs and fingers extended and joined, palm to the left, and the hand and wrist straight. You also keep your upper arm horizontal and the forearm inclined at an angle of  $45^{\circ}$ . At the same time, you turn your head and eyes toward the person you are saluting. The second part of this movement consists in dropping your arm to your side and turning your head and eyes to the front.

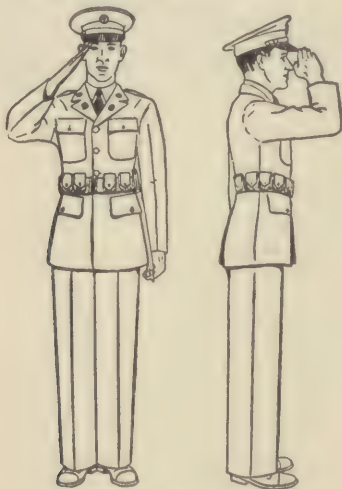


Figure 24. Hand Salute.

b. You execute the first position of the hand salute when the person you are saluting is six paces from you or at his nearest point of approach if more than six paces. You hold that position until your salute has been returned or until the person saluted has passed you if he does not return the salute. You then execute the second movement of the hand salute.

## SECTION II

### STEPS AND MARCHINGS

85. a. All steps and marchings that are executed from the halt, except right step, begin with the left foot.

b. Whenever necessary your instructor will indicate the cadence to you by calling "One," "Two," "Three," "Four," as your left and right foot, respectively, touch the ground.

c. All steps and marchings are executed at attention except 1. ROUTE STEP, 2. MARCH and 1. AT EASE, 2. MARCH.

**86. Quick Time.** Being at the halt the commands to move forward in quick time are: 1. FORWARD, 2. MARCH. At the command FORWARD, you shift the weight of your body to the right leg without making any noticeable movement. Do not start to move forward. At the command MARCH, step off smartly with your left foot and continue to march with 30-inch steps straight to the front, at the rate of 120 steps per minute. You do this without stiffness and without exaggerating any of the movements. Swing your arms easily and in their natural arcs, 6 inches to the front and 3 inches to the rear of your body.

**87. Double Time.** a. Being at the halt, or in march in quick time, to march in double time the commands are: 1. DOUBLE TIME, 2. MARCH.

(1) If you are at the halt and the command DOUBLE TIME is given, shift your weight to your right leg without noticeable movement just as you did at the command FORWARD. At the command MARCH, step out and take up an easy running step in the cadence of double time (180 steps, 36 inches each, per minute). At the double time you raise your forearms to a horizontal position at your side, close your fingers, with knuckles out, and allow your arms to swing naturally. Remember to keep your lower arms (forearms) horizontal along your waistline.

(2) If you are already marching at quick time you continue the march at the command DOUBLE TIME. At the command MARCH you take one more step in the cadence of quick time and then step out at the double. You swing your arms the same as you did in (1) above.

b. Being at the double time, to resume the cadence of quick time the commands are: 1. QUICK TIME, 2. MARCH. At the command MARCH you take one step in double time and then commence marching in the cadence of quick time. Allow your arms to drop to your sides and then swing as they should in the cadence of quick time.

**88. To Halt.** a. The halt may be executed as either foot strikes the ground. To halt when marching in quick time, the commands are: 1. SQUAD, 2. HALT. At the command HALT, given as either foot strikes the ground, take one step in quick time and then place your rear foot alongside the leading foot and assume the position of attention.

b. To halt when marching at the double time, the commands are: 1. SQUAD, 2. HALT. At the command HALT, take one step in double time, then one step in quick time and then place your rear foot alongside the leading foot and assume the position of attention.

**89. To Mark Time.** Mark time may be given either while you are marching or while you are at a halt. Mark time may be executed either at quick time or at double time. The commands are: 1. MARK TIME, 2. MARCH.

a. If you are marching when the command MARCH is given, you take one more step forward and then bring up your rear foot and plant it beside your leading foot with your heels on the same line. You then continue the cadence by alternately raising and planting each foot. You raise your feet 2 inches

in marking time. The command MARCH may be given as either foot is on the ground.

b. If you are at a halt when the command MARCH is given, you alternately raise and plant each foot, beginning with your left just as you did in *a*, above.

c. You execute the halt from mark time just as you did from quick time or from double time, except that a 2-inch vertical step is substituted for the 30-inch forward step.

**90. Half Step.** *a.* The commands are: 1. HALF STEP, 2. MARCH.

(1) If you are marching at quick time when the command MARCH is given, you take one more 30-inch step, then begin taking 15-inch steps. The cadence does not change.

(2) If you are marching at double time when the command MARCH is given you take one more 36-inch step, then begin 18-inch steps at the double time rate.

b. FORWARD, HALF STEP, HALT, OR MARK TIME may each be executed one from the other either in quick or double time.

c. If you are marching at the half step, the commands to take up the full step will be: 1. FORWARD, 2. MARCH.

d. If you are marking time, the same commands are given to take up the full step, that is: 1. FORWARD, 2. MARCH.

**91. Side Step.** *a.* The commands to take up the side step are: 1. RIGHT (LEFT) STEP, 2. MARCH. These commands are given only from the halt or while marking time.

(1) 1. RIGHT STEP, 2. MARCH. At the command MARCH, you move the right foot 12 inches to the right and plant it. You then move the left foot and place it beside the right, left knee straight. You now continue in the cadence of quick time by starting again with the right foot.

(2) 1. LEFT STEP, 2. MARCH. Left step is executed in the corresponding manner, starting with the left foot instead of the right.

b. The side steps are used for short distances only. The side step is never executed in double time.

c. To halt from the side step the commands are: 1. SQUAD, 2. HALT. The command HALT is always given when the heels are together. At the command HALT you take one more 12-inch step to the flank and then bring your feet together and halt.

**92. Back Step.** The commands to take up the back step are: 1. BACKWARD, 2. MARCH. These commands are given only while at the halt or while marking time.

*a.* At the command MARCH you take a 15-inch step straight to the rear.

b. The back step, like the side step, is used for short distances only and is never executed at double time.

**93. To Face in Marching.** The facings in marching are an important part of movements such as COLUMN RIGHT, CLOSE, TAKE INTERVAL, EXTEND, etc. Facings in marching may be executed either from the halt or while marching.

*a.* (1) Assume you are at a halt and are required to face to the right and commence marching in that direction. At the command of execution you turn to the right on the ball of your right foot and at the same time you step off with your

left foot in the new direction. The length of this step will vary with the movement being executed. It may be a full step or a half step. It may be executed at either quick time or at double time.

(2) Assume you are at the halt and are required to face to the left and commence marching in that direction. At the command of execution you face to the left on the ball of the right foot and at the same time step off with your left foot in the new direction.

b. (1) Assume you are now marching and are required to face to the right and continue marching in the new direction. The command of execution will be given as your right foot strikes the ground. At that command you advance and plant your left foot. You then face to the right in marching and at the same time step off in the new direction with your right foot. Again the length of this step will depend on whether you are marching at the half step, quick time, or double time.

(2) Assume you are now marching and are required to face to the left and continue marching in the new direction. This time the command of execution will be given as your left foot strikes the ground. At the command you advance and plant your right foot. You then face to the left in marching and at the same time step off in the new direction with your left foot.

c. To face to the rear while marching the commands are: 1. TO THE REAR, 2. MARCH. This command will be given as your right foot strikes the ground. At the command of execution, advance and plant your left foot. You then turn to the right about on the balls of both feet and immediately step off in the new direction with your left foot.

**94. To March by the Flank.** Being in march, the commands are: 1. BY THE RIGHT (LEFT) FLANK, 2. MARCH.

a. 1. BY THE RIGHT FLANK, 2. MARCH. This command will be given as your right foot strikes the ground. At the command MARCH advance and plant your left foot and face to the right in marching. You then step off in the new direction with the right foot.

b. 1. BY THE LEFT FLANK, 2. MARCH. This command will be given as your left foot strikes the ground. At the command MARCH advance and plant your right foot, face to the left in marching, and move off in the new direction with your left foot.

**95. To Change Step.** The commands are: 1. CHANGE STEP, 2. MARCH. This command may be given as either foot strikes the ground. The command is used only while marching.

a. If the command of execution (MARCH) is given as your right foot strikes the ground, you advance and plant your left foot. You then place the toe of your right foot near the heel of your left foot and immediately step off with your left foot.

b. If the command of execution is given as your left foot strikes the ground, you change step on the right foot.

**96. To March Other Than at Attention.** The commands are: 1. ROUTE STEP, 2. MARCH; or 1. AT EASE, 2. MARCH.

*a.* 1. ROUTE STEP, 2. MARCH. At the command MARCH you are not required to march at attention, in cadence, or to maintain silence.

*b.* 1. AT EASE, 2. MARCH. At the command of execution you are not required to march at attention or in cadence. You are, however, required to maintain silence.

## CHAPTER 8

### SQUAD AND PLATOON DRILL, WITHOUT ARMS

	Paragraphs
Section I. The squad .....	97-111
Section II. The platoon .....	112-126

#### SECTION I

#### THE SQUAD

**97. General.** *a.* The squad is a group of soldiers organized primarily as a combat team. It consists of one squad leader and other personnel as authorized by appropriate Tables of Organization. When the squad leader is absent, he is replaced by the second in command. If the second in command is also absent, the next senior member of the squad acts as leader.

*b.* As far as practicable, the squad is kept intact. The normal formation of the squad is a single rank or single file. This permits variation in the number of men composing the squad.

*c.* The squad in line marches to the left or to the front only for minor changes of position.

**98. To Form the Squad.** *a.* The command is: **FALL IN.** At the command **FALL IN**, the squad forms in line as shown in figure 27. On falling in, each man except the one on the left extends his left arm laterally at shoulder height, palm of the hand down, fingers extended and joined. Each man, except the one on the right, turns his head and eyes to the right and places himself in line so that his right shoulder touches lightly the tips of the fingers of the man on his right. As soon as proper intervals have been obtained, each man drops his arm smartly to his side and turns his head to the front.

*b.* To form at close intervals, the commands are: 1. **AT CLOSE INTERVALS**, 2. **FALL IN.** At the command **FALL IN**, the men fall in as in *a* above, except that close intervals are obtained by placing the left hands on the hips as shown in figure 28. In this position the heel of the palm of the hand rests on the hip, the fingers and thumb are extended and joined, and the elbow is in the plane of the body.

*c.* The squad falls in on the right file if the squad leader is not in ranks. If the squad is formed under arms, pieces are at once inspected.

**99. Previous Instructions Applicable.** The squad executes the positions and movements as prescribed in Chapter 7, all men executing the movements simultaneously.

**100. To Dismiss the Squad.** The commands are: 1. **INSPECTION**, 2. **ARMS**, 3. **PORT**, 4. **ARMS**, 5. **DISMISSED**, or 3. **UNLOCK PIECES**, 4. **DISMISSED** (if armed with the M1 rifle).

**101. To Count Off.** *a.* The command is: **COUNT OFF.** At the command **COUNT OFF**, each man of the squad, except the one on the right flank, turns his head and eyes to the right. The right flank man calls out "One." Each man in

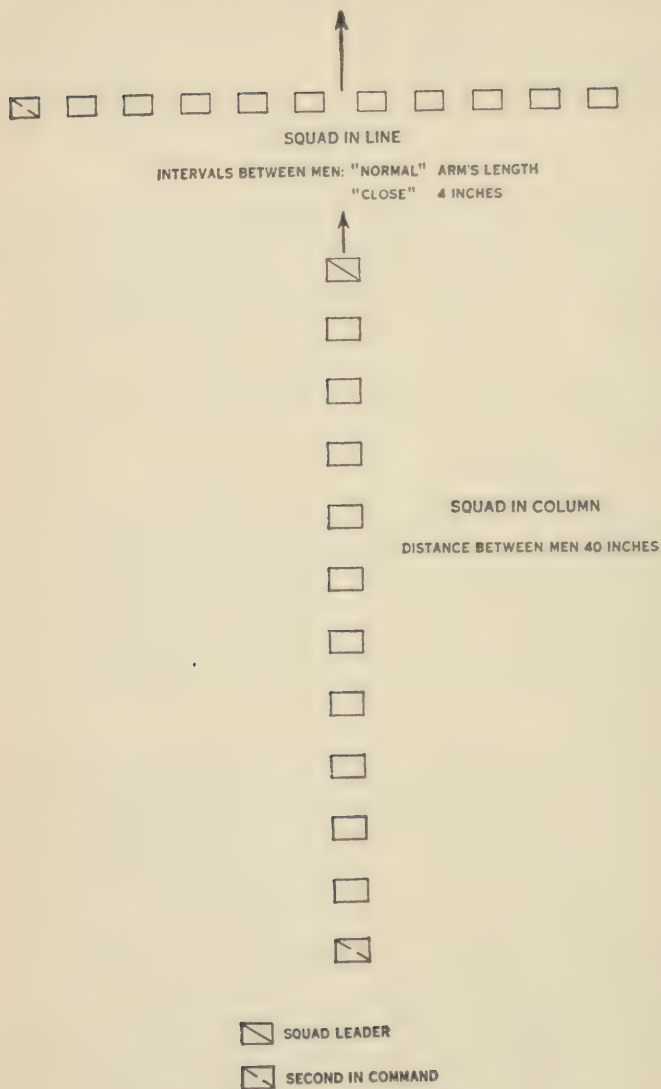


Figure 25. The Squad:

RIFLE  
SQUAD

RIFLE SQUAD  
WITH  
AUTOMATIC  
RIFLE

LIGHT  
MACHINE  
GUN  
SQUAD

60 MM  
MORTAR  
SQUAD

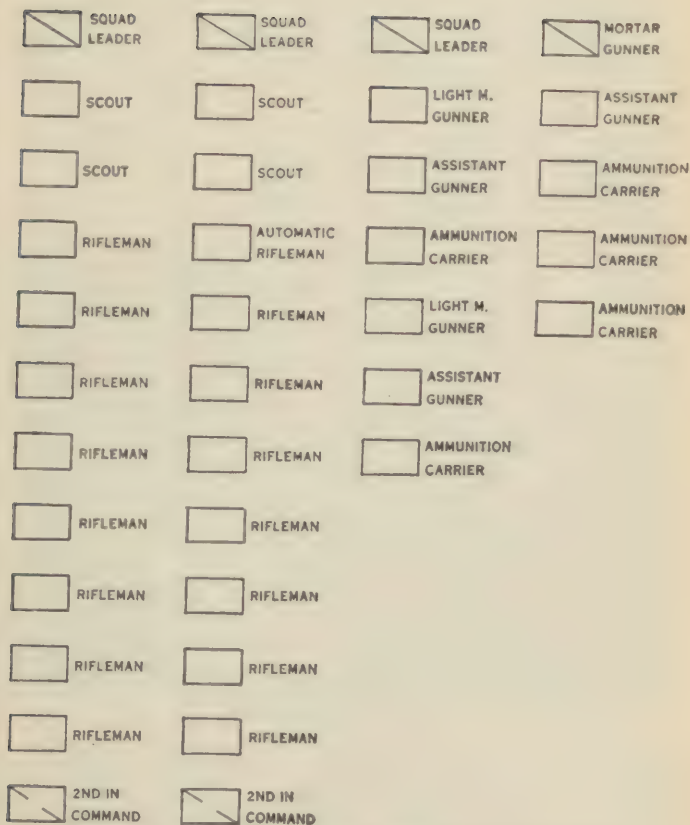


Figure 26. Details of Infantry Rifle Company Squads.

succession calls out, "Two," "Three," etc., turning his head and eyes to the front as he gives his number.

b. This command may be given whenever it is desired that the men know their relative position in the squad.

**102. To Aline the Squad.** a. If in line, the commands are: 1. DRESS RIGHT (LEFT), 2. DRESS, 3. READY, 4. FRONT. At the command DRESS, each man except the one on the left extends his left arm (or if at close interval, places his left hand upon his hip), and all aline themselves to the right. The instructor places himself on the right flank one pace from and in prolongation of the line and facing down the



Figure 27. FALL IN.

line. From this position he verifies the alinement of the men, ordering individual men to move forward or back as is necessary. Having checked the alinement, he faces to the right in marching and moves three paces forward, halts, faces to the left and commands: 1. READY, 2. FRONT. At the command FRONT, arms are dropped quietly and smartly to the side and heads turned to the front.

b. If in column the command is: COVER. At the com-



Figure 28. 1. At Close Intervals, 2. FALL IN.

mand COVER, men cover from front to rear with 40 inches distance between men.

**103. Being in Line at Normal Interval, to Obtain Close Interval.** The commands are: 1. CLOSE, 2. MARCH. At the command MARCH, all men except the right flank man face to the right in marching and form at close interval, as prescribed in paragraph 98b.

**104. Being in Line at Close Interval, to Extend to Normal Interval.** The commands are: 1. EXTEND, 2. MARCH. At the command MARCH, all men except the right flank man face to the left in marching and form at normal interval as prescribed in paragraph 98a.

**105. Being in Line, to March to the Flank.** The commands are: 1. RIGHT (LEFT), 2. FACE, 3. FORWARD, 4. MARCH. The movements are executed as explained in paragraphs 83 a and 86, all men stepping off simultaneously.

**106. To March to the Oblique.** a. For the instruction of recruits, the squad being in column or correctly alined, the instructor causes each man to face half right (left), points out his position, and explains that it is to be maintained in the oblique march.

b. The squad being in any formation, the commands are: 1. RIGHT (LEFT) OBLIQUE, 2. MARCH. At the command MARCH, given as the right foot strikes the ground, each individual advances and plants the left foot, faces half right in marching and steps off in a direction of 45° to the right of his original front. He preserves his relative position, keeping his shoulders parallel to those of the guide (man on right front of line or column), and so regulates his step that the ranks remain parallel to their original front.

c. The command HALT is given on the left foot when halting from the right oblique and on the right foot when halting from left oblique. At the command HALT, given as the left foot strikes the ground, each individual advances and plants the right foot, turns to the front on the ball of the right foot, and places the left foot by the side of the right foot.

d. To resume the original direction, the commands are: 1. FORWARD, 2. MARCH. At the command MARCH, each individual faces half left in marching and then moves straight to the front.

e. If at HALF STEP OR MARK TIME while obliquing, the FULL STEP is resumed by the command: 1. OBLIQUE, 2. MARCH.

f. To give volume to the command the word "oblique" is pronounced to rhyme with "strike."

**107. To March Toward a Flank While in March.** a. The commands are: 1. BY THE RIGHT (LEFT) FLANK, 2. MARCH. At the command MARCH, each individual executes the movement as prescribed in paragraph 94.

b. This movement is used when a quick movement to the right or left for a short distance is required. Normally the unit is halted, faced in the desired direction, and started forward again by the commands: 1. FORWARD, 2. MARCH.

**108. Being in Column, to Change Direction.** The commands are: 1. COLUMN RIGHT (LEFT) (HALF RIGHT) (HALF LEFT),

**2. MARCH.** At the command **MARCH**, the leading man executes the movement as prescribed in paragraph 93 *a* and *b*. The other men in the column execute the same movement successively and on the same ground as the leading man.

**109. Being in Line, to Take Interval and Assemble.** *a.* To take interval, the commands are: 1. **TAKE INTERVAL TO THE LEFT (RIGHT)**, 2. **MARCH**. At the command **MARCH**, the right flank man stands fast and extends his left arm at shoulder height, palms of the hand down, fingers extended and joined until the man on his left obtains the proper interval, then he drops his arm. Other men face to the left in marching and step out until they have an interval of two arms' length from the man on their right. Each man, except the one on the left who raises his right arm only, extends both arms laterally at shoulder height. Each man, except the right flank man, then turns his head and eyes to the right and places himself in line so that the finger tips of his right hand touch lightly the finger tips of the left hand of the man on his right. As soon as each man alines himself at two arms' length intervals from the man on his right, he drops his right arm to the side and turns his head and eyes to the front. He drops his left arm to the side when the man on his left has obtained his proper interval. If under arms, rifles will be slung prior to the execution of this movement.

*b.* To assemble, the commands are: 1. **ASSEMBLE TO THE RIGHT (LEFT)**, 2. **MARCH**. At the command **MARCH**, the right flank man stands fast. All other men face to the right in marching and form at normal intervals as in paragraph 98 *a*.

**110. Column of Twos.** When marching small groups, not at drill, the group may be marched in column of twos by forming it in two ranks and giving the command: 1. **RIGHT (LEFT)**, 2. **FACE**.

**111. To Form Column of Twos From Single File and Reform.** *a.* The squad being in column, at a halt, to form column of twos, the commands are: 1. **FORM COLUMN OF TWOS**, 2. **MARCH**. At the command **MARCH**, the leading man stands fast; the second man in the squad moves by the oblique until he is to the left of and abreast of the corporal with normal interval, and halts; the third man moves forward until behind the corporal with normal distance and halts; the fourth man moves by the oblique until he is to the left of and abreast of the third man with normal interval, and halts; and so on.

*b.* The squad being in column of twos, in marching, to re-form single file, the squad is first halted. The commands are: 1. **FORM SINGLE FILE FROM THE RIGHT**, 2. **MARCH**. At the command **MARCH**, the leading man of the right column moves forward, the leading man of the left column steps off to the right oblique, then executes **LEFT OBLIQUE** so as to follow the right file at normal distance. Remaining twos follow successively in like manner.

## SECTION II

## THE PLATOON

**112. Formations of More Than One Squad.** *a.* The squads form in line, one behind the other, with 40 inches distance between ranks.

*b.* Squads are usually arranged to produce a three- or four-rank formation so that by facing to the right the unit will march in column of threes or column of fours depending on the number of squads.

*c.* A two-squad unit forms in two ranks and marches in column of twos.

*d.* A three-squad unit forms in three ranks and marches in column of threes.

*e.* A four-squad unit forms in four ranks and marches in column of fours.

*f.* A platoon composed of two sections of two squads each forms in four ranks and marches in column of fours.

*g.* Movements are described herein for COLUMN OF THREES or FOURS and may be executed by either formation.

*h.* When in line, the platoon is alined as prescribed for the squad in paragraph 102. The alinement of each rank is verified by the platoon leader.

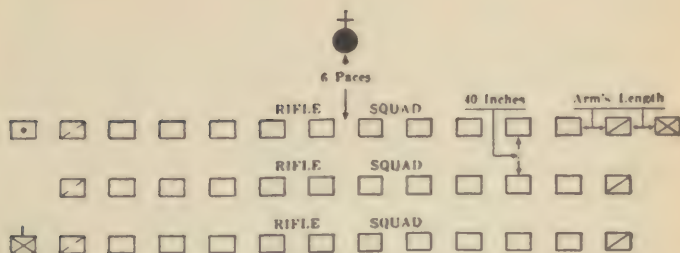
*i.* The platoon being in line takes interval and assembles as prescribed for the squad in paragraph 109. This movement may be ordered after ranks are opened for the display of field equipment or for other special purpose. It is not utilized in forming for physical training.

**113. Composition and Formation of the Platoon.** The platoon consists of platoon headquarters and several squads. Platoon headquarters consists of a platoon leader and one or more assistants. For purposes of drill and ceremonies, a three-squad or four-squad formation should be arranged and the size of the squads equalized. Figure 29 shows how the platoon formation applies to a rifle platoon of infantry.

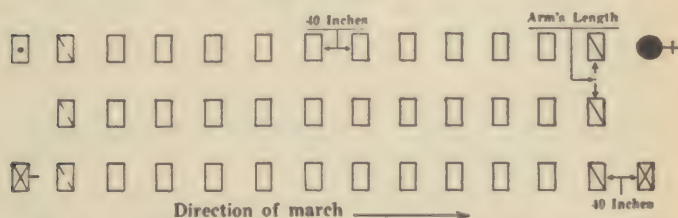
**114. Position of Individuals.** *a.* The platoon leader takes position six paces in front of the center of his platoon when in line. In march formation (column of threes or fours), he marches at the head of his platoon as shown in figure 29.

*b.* The second in command of a platoon takes position on the left of the left man of the rear rank when squads are in line unless otherwise indicated. When squads are in column, he follows the rear man in the right squad of the unit. The second in command observes the conduct of the unit, sees that the proper formation is maintained, and that commands are promptly and properly executed. The platoon guide (a sergeant or other specially designated noncommissioned officer) is posted on the right of the right flank man of the front rank when in line. In column, he takes post in front of the right flank man. He is responsible for maintaining the proper direction and cadence of march of the platoon.

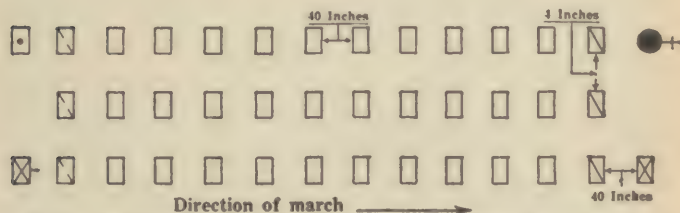
*c.* Other noncommissioned officers (such as mess and supply sergeants, clerks, etc.) and privates (such as cooks, armorers, etc.), when attached to the platoon, fall in on the



1. Rifle platoon in line faced to the front



2. At the commands: 1 Right 2. FACE, The platoon faces to the right Platoon leader and guide change to new positions  
At the commands: 1. Forward 2. MARCH It moves off



3. At the commands: 1. Close 2. MARCH The squad columns close to the center to 4-inch intervals

### PLATOON IN LINE BEING MARCHED TO THE RIGHT

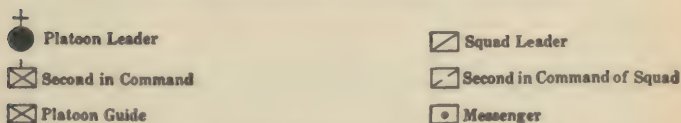


Figure 29. Rifle Platoon in Line, Marched to the Right.

left when in line (or in rear when squads are in column) and march as part of regularly organized squads.

**115. To Form the Platoon.** *a.* The command is: **FALL IN.** At the command **FALL IN**, the first squad forms in line, as prescribed in paragraph 98*a*, its center opposite and three paces from the platoon sergeant. The other squads form in rear of the first squad and in the same manner, with 40 inches distance between ranks. Members of the rear squads extend their arms to obtain their approximate intervals but cover the corresponding members in the first squad. The guide places himself as shown in figure 29.

*b.* To form with close interval, the commands are: 1. **AT CLOSE INTERVALS**, 2. **FALL IN.** At the command **FALL IN**, the movement is executed as prescribed in *a* above except that squads form at close intervals (par. 98*b*).

*c.* The platoon is ordinarily formed and dismissed by the platoon sergeant.

**116. To Dismiss the Platoon.** The command is: 1. **DISMISSED.**

**117. To March the Platoon.** *a.* The normal formation for marching is in column of threes (or fours) with squad columns abreast, squad leaders at the head of their squads.

*b.* The platoon in line marches to the left or to the front only for minor changes of position.

*c.* The platoon being in line to march to the right, the commands are: 1. **RIGHT**, 2. **FACE**, 3. **FORWARD**, 4. **MARCH.** This marches the platoon in column of threes (or fours) to the right.

**118. Guide in Marching.** Except when otherwise directed men in ranks keep the proper distance and interval and align themselves on the men toward the flank on which the guide is marching. When it is desired to guide toward the left, the command is: **GUIDE LEFT.** The guide and the platoon leader then change their relative positions.

**119. Being in Column of Threes (or Fours) at Normal Interval Between Squads, to March (or Form) at Close Interval.** *a.* The commands are: 1. **CLOSE**, 2. **MARCH.** At the command **MARCH**, the squads close to the center by obliquing until the interval between men is 4 inches. The center squad (or squads) take up the half step until the dress has been regained. The distance, 40 inches, remains unchanged.

*b.* If this movement is executed from the halt, the squads close toward the center by executing **RIGHT** or **LEFT STEP** until 4-inch intervals are reached. If in column of threes, the first and third squads **LEFT** and **RIGHT STEP** two steps. If in column of fours, the second and third squads **LEFT** and **RIGHT STEP** one step, the first and fourth squads **LEFT** and **RIGHT STEP** three steps.

**120. Being in Column of Threes (or Fours) at Close Interval Between Squads, to March (or Form) at Normal Interval.** *a.* The commands are: 1. **EXTEND**, 2. **MARCH.** At the command **MARCH**, the squads open to the right and left from the center by obliquing until the interval between men is one arm's length. The center squad (or squads) will take up the half step until the dress has been regained.

*b.* If this movement is executed at the halt, the squads

execute RIGHT or LEFT STEP until they have secured the proper interval by reversing the procedure outlined in paragraph 119b.

**121. Being in Column of Threes (or Fours), to Change Direction.** The commands are: 1. COLUMN RIGHT (LEFT), 2. MARCH. At the command MARCH, given as the right foot strikes the ground, the right flank man of the leading rank faces to the right in marching as prescribed in paragraph 93 a and b, and takes up the half step until the other men of his rank are abreast of him, then he resumes the full step. The other men of the leading rank oblique to the right in marching without changing interval, place themselves abreast of the pivot man and conform to his step. The ranks in rear of the leading rank execute the movement on the same ground, and in the same manner, as the leading rank.

**122. Being in Column of Threes (or Fours), to Form Line to the Front.** The commands are: 1. COLUMN RIGHT, 2. MARCH, 3. PLATOON, 4. HALT, 5. LEFT, 6. FACE. Column right is executed as prescribed in paragraph 121. The command HALT is given after the change of direction is completed.

**123. Being in Any Formation in March, to March Toward a Flank.** The commands are: 1. BY THE RIGHT (LEFT) FLANK, 2. MARCH. This movement is executed as prescribed for the squad in paragraph 107. If the platoon is in column at close (4-inch) intervals, the squads in rear of the squad which becomes the leading squad take up the half-step until they each reach 40 inches' distance from the squad ahead. This movement is used only for short distances.

**124. Being in Line, to Open and Close Ranks.** a. To open ranks the commands are: 1. OPEN RANKS, 2. MARCH, 3. READY, 4. FRONT. At the command MARCH, the front rank takes three steps forward, halts, and executes DRESS RIGHT. The second rank takes two steps forward, halts, and executes DRESS RIGHT. The third rank takes one step forward, halts, and executes DRESS RIGHT. The fourth rank, if any, executes DRESS RIGHT. The platoon leader places himself on the flank of the platoon toward which the dress is to be made, one pace from and in prolongation of the front rank and facing down the line. From this position he alines the front rank. The second and third ranks are alined in the same manner. In moving from one rank to another, the platoon leader faces to the left in marching. After verifying the alinement of the rear rank, he faces to the right in marching, moves three paces beyond the front rank, halts, faces to the left and commands: 1. READY, 2. FRONT.

b. To close ranks, the commands are: 1. CLOSE RANKS, 2. MARCH. At the command MARCH, the front rank stands fast; the second rank takes one step forward and halts; the third rank takes two steps forward and halts; and the fourth rank, if any, takes three steps forward and halts. Each man covers his file leader.

**125. To Form for Shelter Tents.** The platoon being in line the commands are: 1. FORM FOR SHELTER TENTS TO THE LEFT (RIGHT), 2. MARCH, 3. DRESS RIGHT (LEFT), 4. DRESS, 5. READY, 6. FRONT, 7. COUNT OFF.

a. At the command **FORM FOR SHELTER TENTS TO THE LEFT (RIGHT)**, the second in command moves to a position on the right of the guide who is on the right of the right man of the front rank. The messenger takes position on the left of the left man of the rear rank.

b. At the command **MARCH**, all squads except the front squad face to the left in marching and step off. Squad leaders by giving the appropriate commands, 1. **BY THE RIGHT (LEFT) FLANK**, 2. **MARCH**, and 1. **SQUAD**, 2. **HALT**, move their squads into line abreast of the squad(s) already on line.

c. At the commands 3. **DRESS RIGHT (LEFT)**, 4. **DRESS**, 5. **READY**, 6. **FRONT**, and 7. **COUNT OFF**, given by the platoon leader, the entire rank executes these movements as prescribed in paragraphs 101 and 102.

d. On direction of the platoon leader, the odd numbers draw their bayonets and thrust them into the ground alongside the outside of the left heel near the instep. The bayonet indicates the position of the front tent pole. Men not equipped with bayonets mark the place with the left heel. Odd and even numbers (Nos. 1 and 2; Nos. 3 and 4; etc.) pitch tents together.

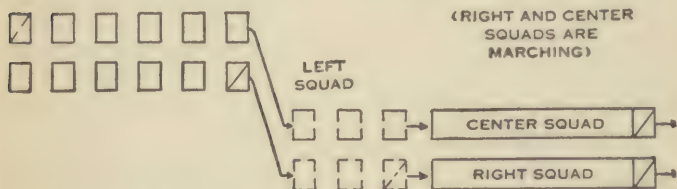


Figure 30. Column of Twos From Column of Threes.

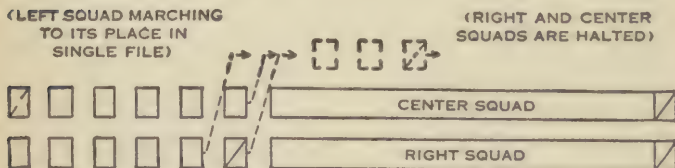


Figure 31. Re-form Column of Threes From Column of Twos.

e. To assemble, the platoon is faced to the right and re-formed from single file into column of threes (or fours) to the right (left) as prescribed in paragraph 126c(2). The platoon sergeant and messenger resume their normal posts.

**126. Column of Twos and Single File and Re-form.** The platoon may be marched in column of twos or single file by the procedure given below. This is not a precise movement. It is practiced in drill so that when necessary the movement may be executed smoothly and without delay. The change of column is always made from a halt.

a. (1) The platoon being in column of threes, at a halt, to form column of twos, the commands are: 1. **COLUMN OF**

TWOS FROM THE RIGHT (LEFT), 2. MARCH. At the command MARCH, the right two squads march forward; the left squad forms column of twos as prescribed for the squad and then executes COLUMN HALF RIGHT and COLUMN HALF LEFT so as to follow in column the leading squads. Forty-inch distances are maintained.

(2) The platoon being in column of twos, at a halt, to reform in column of threes, the commands are: 1. COLUMN OF THREES TO THE LEFT (RIGHT), 2. MARCH. At the command MARCH, the leading two squads stand fast. The rear squad forms single file from the right as prescribed in paragraph 111b and moves to its normal place beside the leading squads by executing COLUMN HALF LEFT then COLUMN HALF RIGHT. It is halted when its leading file is on line with the leading rank of the platoon.

b. (1) The platoon being in column of fours, at a halt, to form column of twos, the commands are: 1. COLUMN OF TWOS FROM THE RIGHT (LEFT), 2. MARCH. At the command MARCH, the right two squads march forward; the left two squads initially stand fast, then follow the leading two squads by executing COLUMN HALF RIGHT and COLUMN HALF LEFT. Forty-inch distances are maintained.

(2) The platoon being in column of twos, at a halt, to reform in column of fours, the commands are: 1. COLUMN OF FOURS TO THE LEFT (RIGHT), 2. MARCH. At the command MARCH, the leading two squads stand fast. The two rear squads move to their normal places by executing COLUMN HALF LEFT then COLUMN HALF RIGHT and are halted when the leading files are on line with the leading rank of the platoon.

c. (1) The platoon being in column of threes (or fours), at a halt, to form single file, the commands are: 1. COLUMN OF FILES FROM THE RIGHT (LEFT), 2. MARCH. At the command MARCH, the right squad of the platoon moves forward. The other squads stand fast initially and then successively follow the leading squad by executing COLUMN HALF RIGHT and COLUMN HALF LEFT. Distances of 40 inches are maintained.

(2) The platoon being in single file, at a halt, to reform in column of threes (or fours), the commands are: 1. COLUMN OF THREES (OR FOURS) TO THE LEFT (RIGHT), 2. MARCH. At the command MARCH, the leading squad stands fast. The other squads move to their normal places by executing COLUMN HALF LEFT, then, at the proper time, COLUMN HALF RIGHT and are halted when the leading file is on line with the leading rank of the platoon.

d. Whenever commands are given involving movements of squads in which one squad stands fast, takes up the march, continues the march, or changes formation, the squad leader gives the appropriate commands.

## CHAPTER 9

### INTERIOR GUARD DUTY

**127.** At each post, camp, or station where troops are present guards are used to preserve order, protect property, and enforce police regulations. The commanding officer of the camp or post determines how large a guard is necessary for these purposes and issues the necessary orders. When your company, troop, or battery commander decides that you have made sufficient progress in your military training, you will probably be detailed for guard duty. The following information will help you in understanding what this duty will be:

**128.** The guard consists of:

Officer of the day.

Officer of the guard (except when the guard is small).

Sergeant of the guard.

Corporals of the guard.

Buglers of the guard.

Privates of the guard.

The guard is under the supervision of the officer of the day.

**129.** The members of the guard may all come from the same company, troop, or battery, or they may be detailed from several different organizations. In either case, when a soldier has served a tour of guard duty he is given credit for it on the guard roster and does not again do guard duty until all other men on the roster have served their tours.

**130.** The length of a tour of guard duty is 24 hours. At the end of that time the "old guard" is relieved by the "new guard" of the same size. As soon as the new guard relieves the old guard at the guardhouse it is divided into three parts called "reliefs." These reliefs are rotated so that each member of the guard has 2 hours on duty followed by 4 hours off duty. Privates of the guard are assigned to reliefs by the sergeant of the guard, and to posts by the corporals of their reliefs. Privates are not changed from one relief to another during the same tour of duty, except by proper authority.

**131.** While you are off duty do not remove your clothing or equipment or leave the immediate vicinity of the guardhouse without permission of the commander of the guard. An emergency may occur when you will be needed at once.

**132.** When you are not posted as a sentinel or on other duty which requires you to carry your rifle, keep it in the arms rack in the guardhouse or in a stack.

**133.** Orders for sentinels are of two classes: general orders and special orders. *General orders* apply to all sentinels. *Special orders* apply to particular posts and duties. You must know and be able to recite the general orders before you go on guard duty. As soon as you are assigned to a relief and a particular post you must also learn and be able to recite the special orders for that post. Whenever the officer of the day or the commander of the guard considers that a sentinel does not have sufficient instruction or is otherwise unfit for guard duty, he relieves him, sends him back to his organization, and notifies his organization commander.

134. The following are the general orders all sentinels are required to memorize. Learn them as soon as you can.

*My general orders are—*

1. To take charge of this post and all Government property in view.

2. To walk my post in a military manner, keeping always on the alert and observing everything that takes place within sight or hearing.

3. To report all violations of orders I am instructed to enforce.

4. To report all calls from posts more distant from the guardhouse than my own.

5. To quit my post only when properly relieved.

6. To receive, obey, and pass on to the sentinel who relieves me all orders from the commanding officer, officer of the day, and officers and noncommissioned officers of the guard only.

7. To talk to no one except in line of duty.

8. To give the alarm in case of fire or disorder.

9. To call the corporal of the guard in any case not covered by instructions.

10. To salute all officers and all colors and standards not cased.

11. To be especially watchful at night and, during the time for challenging, to challenge all persons on or near my post, and to allow no one to pass without proper authority.

135. Guard duty is one of your most important duties. Remember that when you are posted as a sentinel you represent the commanding officer whose orders you are required to enforce, on and in the vicinity of your post. Upon the manner in which you perform your duties depends not only the enforcement of military law and orders, but also the security of persons and property under your charge. In time of war your responsibility as a member of the guard is greater than ever, for then the safety of your organization depends upon the manner in which you watch while your comrades rest. This is so important that sleeping on post by a sentinel or other improper performance of duty is punishable by a very severe court-martial sentence.

## CHAPTER 10

### MARCHES, CAMPS, AND BIVOUACS

Paragraphs

Section I. Marches .....	136-140
Section II. Camps and bivouacs .....	141-144

#### SECTION I

#### MARCHES

**136.** One of your principal jobs in the field is marching. Battles take place at indefinite intervals, but marches occur daily. To win battles troops must arrive on the battlefield on time and in good physical condition. To accomplish this they must be able to march.

**137. Preparations.** *a.* When you learn that your organization is to make a march the next day there are certain things you should attend to the evening before. See that your canteen is clean and filled with fresh water as there may be little time for this in the morning. Check your personal equipment and see that you have all the articles necessary for personal cleanliness, and for keeping your clothing in repair. This should include towel, soap, toothbrush, pocket comb, small mirror, needles, thread, safety pins, and spare buttons. Check up on the adjustment of your pack straps and belt. A poorly adjusted pack adds to the discomfort and fatigue of a march. You should have at least two pairs of woolen socks without holes or mends. See that your shoes or boots fit comfortably, are in good repair, and well broken in. Never start a march with a new pair of shoes or boots. If you are in a mounted organization inspect your equipment carefully and replace any missing or doubtful parts. Nose bags should be filled with the morning feed as soon as the animals have finished their evening feed of grain. Grain bags should be filled before dark. If you are on guard, you should know where to find the cooks and when to awaken them.

Before dark dispose of any trash or debris that may have collected in or around your tent area. This will save you time and effort in the morning, especially if your organization is to break camp before daylight. Our Army takes pride in always leaving a camp site in better condition than we found it.

*b.* On the morning of the march turn out promptly at the first call for reveille, perform your toilet, and make up your roll and pack, or pack your saddle. According to the instructions of your commanding officer you will water and feed your animal, if mounted, eat breakfast, and wash and pack your mess kit. After breakfast you will be allowed 10 or 15 minutes to relieve yourself and complete your pack and roll. While drivers warm their motors, or harness and hitch their animals, other soldiers help in packing the kitchen, taking down the officers' tents and picket line, and loading the

forage, filling the sink and latrines, and cleaning the camp area. In mounted organizations, after the order to saddle, you must take particular care to see that the blanket is free of sand or cockleburs, and is without wrinkles. You should know your duties and do them promptly and quietly without confusion or noise. At assembly, fall in fully equipped for marching.

**138.** When you fall in to start the march, do it quietly. One of the indications of a well trained organization is the absence of noise and confusion when starting a march. When you are close to the enemy it will be necessary to maintain quiet for your own protection as he will be on the alert for noises which will help him locate your position. Even when you are at a distance from the enemy, or making a practice march in peace, loud talking and shouting will disturb civilian communities or troops camped nearby who are trying to rest.

**139. Conduct of Individuals.** *a.* Drinking water on a march is largely a matter of habit. Drink plentifully before the start of the march, but after that drink sparingly. Drink none at all for the first 3 or 4 hours of the march. After that, take only a few mouthfuls at the end of a rest period to wash out the throat and mouth. A small pebble carried in the mouth keeps it moist and reduces thirst. Do not drink or eat unwholesome foods or beverages. Use only water approved by your commander. The eating of sweets greatly increases thirst and should be avoided. When a cooked meal is carried do not eat it until the proper time. Excessive perspiration causes the loss to the body of necessary salts; this results in fatigue and heat exhaustion. The eating of common table salt or salt tablets, helps to relieve this condition. Cold coffee or tea will also help.

*b.* You will remember that in Chapter 1 it was stated that civilians will judge your organization and the Army by the conduct and appearance of its members in public. This is especially true of troops on the march. Avoid using profane or obscene language or making remarks to civilians. When you do this, you are not only proving that you are lacking in military discipline but are causing your organization to be considered as poorly trained. This is unfair to your comrades.

*c.* Halts are made at regular intervals to rest the men and animals, to service motors, to adjust equipment, and for other purposes. A halt of 15 minutes is usually made at the end of the first 45 minutes of marching. After the first halt, columns including foot or mounted troops usually halt for 10 minutes each hour. These halts are for the purpose of permitting men and animals to relieve themselves, adjust equipment, and inspect animals, motors, vehicles, and loading. Attend to these things promptly. Do not wait until the command is ready to march again. A mounted man always attends to the needs of his horse and equipment before satisfying his own wants. You should inspect each foot of your horse to see that no shoes have become loosened, or that no stones have become wedged in the frog or shoe. Remove

caked mud or snow with the hoof hook. If you are the driver of a motor vehicle, conduct the general mechanical inspection as you have been instructed, and report promptly the results of your inspection to your chief of section or other designated person.

d. After you have adjusted your own equipment and that of your mount, or completed your vehicle inspection, rest as much as possible during the remainder of the halt. Do not stand or wander about. If the ground is dry, remove your pack and stretch out at full length in as comfortable a position as possible. The next best way is to sit down with a good back rest against a tree, fence, or embankment. Never sit or lie on wet ground. If you find it necessary to answer the calls of nature, dig a small pit and immediately refill it after use.

e. Do not enter private property without permission or take fruit or vegetables from orchards and gardens. These are serious military offenses.

**140. Road Discipline.** a. *General.* (1) In marching, troops usually keep to the right of the road, leaving the left free for other traffic. If the left of the road has better concealment from air observation, or for other reasons, troops may be directed to march on the left of the road, keeping the right free for traffic. On certain occasions they may march on both sides of the road, leaving the middle clear.

(2) In any event, your organization commander will announce how you will march. The important thing for you to remember is that you must stay *at all times* on the side of the road as he has directed, and not straggle back and forth across the road or out into the middle. Before your organization starts its march other troops, and especially motor units, will be informed which parts of the road will be left free for them. *Acting on this information, motor vehicle units may sometimes move as rapidly as 60 miles an hour past your column.* You can see how easily serious accidents and traffic tie-ups may occur if you do not keep your prescribed distance and place in the column and interfere with the right-of-way of other traffic, both military and civilian. At halts, immediately clear the road by moving off to the side on which you have been marching, unless otherwise directed. At the preparation signal for resuming the march, fall in promptly.

(3) Every march is planned so as to bring troops to a certain place at a definite time, and in such good condition that they can fight immediately, if required. In order to do this a very careful supervision is necessary so that large numbers of troops as well as food, ammunition, and other supplies can move forward without causing traffic jams. To assist in this movement military police are stationed at certain critical places and patrol the roads. They wear a blue arm band with the letters MP in white. They know on which roads it is safe for you to march and at what hours. They are there to help and protect you and their instructions and orders must be obeyed.

(4) If you are marching at night, you must make special

efforts to remain alert. Be careful not to ride or walk too close to the man ahead of you, or to lag behind. When night marches are made to maintain secrecy, you remain silent and smoking and the lighting of matches or flashlights are forbidden.

b. *Foot troops.* If you become sick or unable to continue the march, do not fall out until you receive permission from an officer. Then wait beside the road for the medical detachment, which marches at the rear of the column. If you fall out without permission, you are subject to arrest by a police detachment, which follows the column. Your organization will take great pride in the fact that no one has had to fall out. If you have made the proper preparations with respect to your shoes and socks, and do not eat or drink too much, you will have no difficulties with the average march.

c. *Mounted troops.* (1) Do not slouch in the saddle or ride with the weight on one buttock. The proper position in the saddle will not only be less tiring to you but will probably prevent your horse from having a sore back.

(2) Keep your head up and remain alert. Increase and decrease your gait *promptly* at the command. Failure to do this, or to maintain the proper gait, will result in a continual stringing out and jamming up of riders in the column. This may not only result in injury to the horse but will soon tire out both horse and man.

(3) Be alert to pass signals down the column, especially warnings of obstacles in the road, such as bottles, wire, holes, and narrow culverts. Failure to do this may result in serious injury to someone in rear of you.

(4) Watch your horse for signs of lameness and ask for permission to fall out if such condition is discovered. He may have picked up a rock or a nail. If necessary, wait for the veterinary officer.

(5) If you have to fall out, regain your position in the column gradually by increasing the length of the trot periods and decreasing the length of the walk periods. If you are delayed more than 10 minutes, join another organization temporarily and rejoin your own organization at one of the hourly halts or in bivouac.

(6) If you are marching at night to maintain secrecy, you should be able to inspect your horse's feet and equipment by feeling, and without the aid of a light.

(7) Select the best possible footing for your horse. A smooth, level surface, even concrete, is to be preferred to rough, sloping shoulders found along many highways.

(8) In removing side loads or equipment at the hourly halts be sure they are placed so that they will not be damaged by horses or be in the way of traffic. Horses moved to the side of the road must be kept clear of wire fences so that bridles or other parts of equipment do not become caught.

(9) In horse-drawn artillery units, the cannoners usually ride on the vehicles. When walking, they should keep to the right of the column or in the space between vehicles. Under no circumstances should they walk between the front and rear vehicles of limbered vehicles.

*d. Armored and motorized units.* (1) Since rapid movement is one of the principal advantages of armored and motor units, it is important that every driver and other operating personnel with these units know not only how properly to drive and care for a vehicle but also the fundamentals of successful marching.

(2) Good mechanized and motorized troops can march 180 miles per day on roads at an average speed of 25 miles per hour, or, in an emergency, they can march 450 miles in 24 hours. They can march on roads at night without lights at speeds up to about 15 miles per hour, but marching across country at night is very difficult, except under favorable conditions. In preparing for a march, warning is usually issued ahead of the starting hour so that crews of vehicles can carefully check equipment and vehicles and see to it that everything is ready and in good condition.

(3) If you are the driver of a motor vehicle during the march you must keep on the alert to maintain the ordered speed and the proper distance on the road from the vehicle just ahead in the column. You must also be familiar with arm, hand, and light signals so that these signals may be quickly passed down the column from front to rear. If this is not done it causes vehicles to "jam up" in column, and results in those at the tail having to travel at high speeds at times, in order to keep up and not lose sight of vehicles ahead of them. This often results in accidents, especially when passing through towns, so it can be seen that bad driving on the part of just one driver may spoil the march for an entire unit.

(4) No rule can be given for the distances which should be kept between vehicles in the marching column on the road. This will depend on a number of things, such as the ordered speed of the march, the kind of vehicles in the column, the road conditions and, perhaps most of all, on the possibility of an enemy air attack. To lessen the danger of an air attack, vehicles and organizations must often march at increased distances. When marching at night, speeds are usually reduced and distances lessened so that contact may be maintained in the column.

(5) Halts are usually prescribed in the march order to come at a certain time, and when the time arrives each vehicle either halts in place, or closes up so that the entire unit is closed up when the last vehicle is halted. Whether vehicles halt in place or close up will depend on many factors, but drivers are always told what to do about this before the march starts. Motor vehicles will seldom close up during daylight, because of the danger of an air attack.

(6) Before halting, vehicles always move well off the road so as to keep the road clear. If men dismount, they also move off the road so as not to interfere with other traffic and to avoid accidents. Officers, noncommissioned officers, and drivers proceed with the necessary inspections and servicing. If roads are very narrow, men are usually stationed at the head and tail of each unit to direct civilian traffic and see to it that the road is kept clear.

(7) Halts usually come once every 2 hours and are for 10 minutes' duration, unless a longer halt is made at noon for lunch and servicing. During a march if any vehicle has mechanical trouble, the driver pulls off the road and allows vehicles behind to pass. If the driver or unit mechanic can correct the trouble, he does so and resumes the march. He does not, however, attempt to regain his place in column by picking up high speeds, but falls in at the tail of the nearest unit, and does not pass any vehicles until those ahead have halted, at which time he may go forward to join his unit. If the entire column has passed, he proceeds alone at normal speed into camp.

(8) Every car commander or driver must know the route of the march and where the unit is going to camp for the night and should have a marked road map. Otherwise he will not know where to go if contact with the vehicle ahead is lost or his vehicle has to stop on account of mechanical trouble.

## SECTION II

### CAMPS AND BIVOUACS

**141. Kinds of Shelter.** In the theater of operations, troops are sheltered in billets, bivouac, camp, or cantonment.

a. Troops are in *billets* when they occupy private or public buildings.

b. When troops rest on the ground with no overhead cover, or under shelter tents, or improvised shelter, they are in *bivouac*.

c. When troops are sheltered by heavy tentage (tent camps) they are in *camp*; when quartered in temporary structures, especially constructed for military purposes, they are in *cantonment*.

**142. Camp Sites.** The ideal camp site should have plenty of pure water, tough grass turf, and access to a good road. It should be of ample size and provide concealment from enemy airplanes. It should avoid dusty, polluted, or damp soil, stagnant water, and dry stream beds. In hot weather a shady area free of underbrush is desirable. In war, battle needs may force the use of poor camp sites.

**143. Personal Care and Comfort.** a. (1) The shelter tent is a small tent capable of providing shelter for two men. (See fig. 32.)

(2) It may be pitched singly or two tents may be pitched together known as a double shelter tent. (See fig. 33.) Use of double shelter tents conserves space and, being occupied by four men, they are warmer.

(3) (a) The platoon having been formed for shelter tent pitching as described in paragraph 125 (platoon drill), at the command, **PITCH TENTS**, each man (if armed with the rifle) steps off obliquely with the right foot a full pace to the right front, lays his rifle on the ground, muzzle to the front, barrel to the left, butt near the toe of his right foot. He then steps back into place. All men then unsling equipment and place



Figure 32. Shelter Tents.

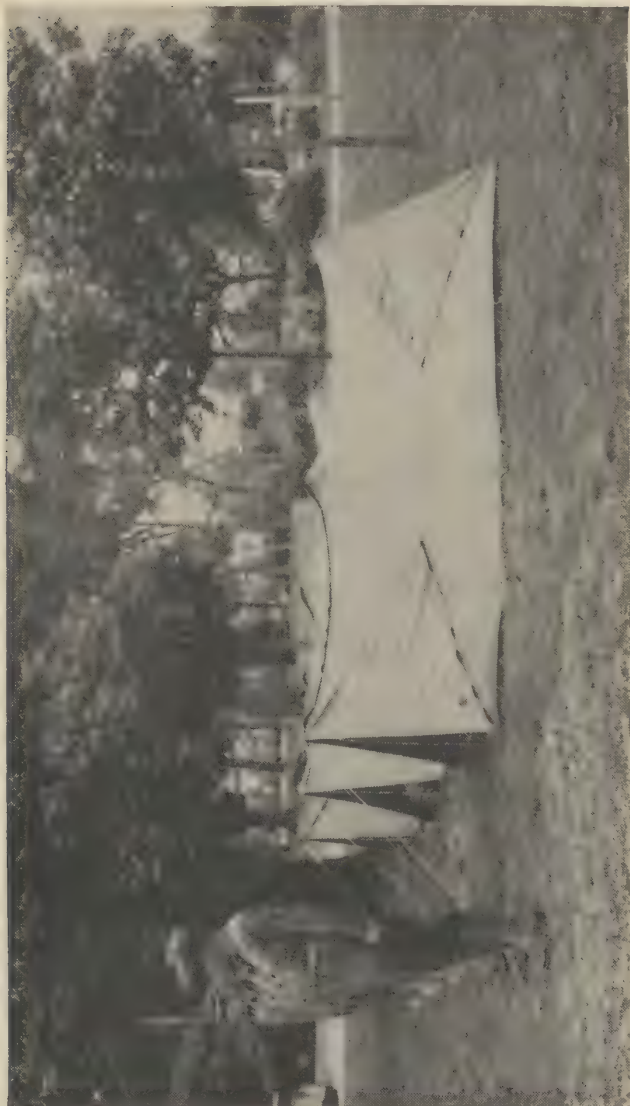


Figure 33. Double Shelter Tents.

their packs (or rolls) on the ground in front of them, haversacks (saddlebags or field canvas bags) up and to the front, the packs two paces in front of their positions. They then open their packs and remove their shelter halves, poles and pins. Each odd-numbered man, when not armed with a bayonet, places a pin in the ground on the spot which he previously marked with his left heel. The men of each pair spread their shelter halves on the ground which the tent is to occupy, triangle to the rear, buttons to the center, the even-numbered man's half on the left.

(b) They then button the halves together. The odd-numbered man adjusts his pole through the eyelets in the front of the tent and holds the pole upright in position beside the bayonet (or pin). The even-numbered man pins down the front corners of the tent in line with the bayonets (or pins). He then drives the front guy pin a rifle length in front of the front pole. If he is not armed with the rifle, he measures this distance with his tent rope by taking the distance from the base of the front tent pole to one of the front tent pins. He places the loop of the guy rope over the front guy pin and runs the other end of the rope through the loops of the shelter halves and ties it, making sure that the pole is vertical when the rope is taut. The even-numbered man then adjusts the rear tent pole through the eyelets in the rear of the tent. The odd-numbered man pins down the rear of the tent and drives the rear guy pin so that it is a bayonet length in rear of the rear pin of the triangle. If he is not armed with the bayonet, he drives the rear guy pin two and a half tent pin lengths from the rear triangle pin. He then adjusts the guy rope. The even-numbered man then drives the remaining pins on the left of the shelter tent and the odd-numbered man drives them on the right.

(c) On maneuvers and in active operations you and your tentmate will normally pitch your tent where you will be concealed from enemy observation. The principles of tent pitching given in (a) and (b) above will apply, but there may be no attempt to aline the tents of your organization.

(4) If possible, pick a dry place on high ground for your tent. As soon as your tent is pitched, ditch it, even though you expect to be there only one night. Dig a ditch about 3 inches deep along each side, with a drainage ditch leading off at the lowest side. If it looks as though water may come from higher ground, dig a ditch to divert the water before it can reach your tent. In cold or windy weather the dirt should be banked around the tent. If it rains, loosen the guy ropes to prevent the tent pegs from pulling out. Be sure your tent pegs are securely driven in. If the weather is cold, pitch the closed end of the tent into the wind.

(5) Figure 22 shows you in detail how to display your equipment, if it is required.

b. Take time to make a good bed; it will mean better sleeping. First, level the ground. Then place straw, leaves, or branches on the ground. Place your raincoat over this bedding to keep out the damp. In cold weather you need some-

thing warm under you as well as over you. A newspaper between blankets and clothing, or straw around the feet, will help. Don't lie down directly on wet ground.

Another means for protection against cold is to fold the blanket in such a manner as to form a sleeping bag. Large horse-blanket safety pins or any large safety pins are necessary to keep the folds in position.

c. Take off any wet clothes as soon as you can after reaching camp. Put on dry clothes, or, if that is impossible, dry your clothes before a fire and then put them back on. If you cannot do this, wring them out. Dry your shoes by placing warm, not hot, pebbles inside the shoes. Do not place the shoes next to a fire. It is a good idea to oil the shoes while they are dry to make them waterproof and pliable.

d. (1) As soon as possible after reaching camp wash your feet with soap and water. Dry them carefully, especially between the toes. Until your feet are hardened, dust them with foot powder, which you can get from your corporal or the noncommissioned officer in charge of your unit. Put on a clean pair of socks and the extra pair of shoes.

(2) If blisters have appeared on your feet they should be painted with iodine and emptied by pricking them at the lower edge with a pin which has been passed through a flame. Do not remove the skin. The blister should then be covered with zinc oxide plaster which can be obtained at the aid station. If you have serious abrasions on your feet, corns, bunions, or ingrowing nails, have your name put on the sick report and report to the aid station for treatment.

(3) See that your toenails are short and clean. Cut them straight across and not on a curve. This prevents ingrowing nails.

e. Before building a fire, clear away all dry leaves or grass, leaving a bare spot. Dead branches from trees are more apt to burn than wood gathered off the ground. Stones heated red hot and then placed under a bucket in your tent make a good stove. A canteen filled with hot water makes a good hot water bottle for very cold feet.

f. Read instructions for camp sanitation in chapter 13.

**144. Camps and Bivouacs for Mounted Organizations.** a. In campaign your organization will probably be scattered over a large area to take advantage of cover from ground and air. It will often be necessary to tie horses individually to trees or bushes. Soldiers are grouped together by squads or sections, and bivouac close to their mounts to care for them and be able to leave at short notice, or in the dark. Provide good, dry standing ground for your horse, clear of rocks and stubble, and bed him down well. Guard against the possibility of his becoming entangled in the halter rope or picket line.

b. In severe weather protect your horse from cold winds. If woods with heavy undergrowth are not available, protection may be obtained by using the branches of trees. Avoid stream beds in rainy seasons, as a freshet upstream might cause trouble.

c. By taking the precautions mentioned above it will not normally be necessary to use the saddle blanket as a horse cover because the weather is severe. Horses in good condi-

tion can withstand severe weather very well. If your horse becomes ill from exhaustion or other causes, even in hot weather, it may be necessary to keep him warm and the saddle blanket is useful for this purpose. You will be well repaid for the care and attention you give your mount.

d. Vehicles should stand on hard ground and be grouped for ease of servicing and to prevent hostile observation by the use of natural cover or camouflage. Space is required for turn-arounds and at least two exits from the bivouac area are desirable.

## USE OF COMPASSES AND MAPS

	Paragraphs
Section I. Use of the compass .....	145-149
Section II. Use of maps .....	150-158

## SECTION I

## USE OF THE COMPASS

145. As a soldier, you must be thoroughly familiar with the compass and know how to use it by day and by night.

146. Of the several types of compasses issued to the Army, the prismatic compass (see figs. 34 and 35) is the one most generally used. The compass is an instrument which, by means of a magnetized dial-needle, indicates magnetic north. The dial-needle *b* is graduated into 360 equal subdivisions called degrees, commencing with 0 (zero), or magnetic north, and reading clockwise around the entire circle until 0 (or 360°) is reached again. You will note that with the com-



Figure 34. Prismatic Compass, Showing Compass Open and in Position for Measuring Azimuth in Daylight.

pass dial-needle at rest the 0 is to the north, the 90° graduation is east, 180° is south, 270° is west. Instead of using the directions north, east, south, and west, we may use the terms magnetic-azimuth 0°; magnetic-azimuth 180°, etc. The magnetic-azimuth of any object is merely the compass reading, expressed in degrees, of a line extending out from the center of the compass toward the object.

147. If a line is drawn from the center of the dial-needle to any object in your view you can find its azimuth by de-

termining which number, or degree of graduation, this line crosses on the compass dial. It is done in this manner: Raise the eyepiece *a* and the cover *d* and move the clamp at *g* releasing the dial (*b*) so that it swings freely. Hold the compass as shown in figure 34. Turn about slowly and carefully until the object, the azimuth of which you want, is lined up by the slit on eyepiece *a* and by the hair-line *f* on the glass cover. Allow the dial-needle *b* to come to rest. Then read the azimuth through the eyepiece *a*.

148. At night you may often depend on your compass almost entirely to keep on a required direction. Assume you are to march at night on a magnetic azimuth of  $55^{\circ}$ . By daylight, or at night by light in a sheltered place, release the compass box glass by unscrewing the screw at *h*. Move the radiolite marker *c* on the movable index ring to 55, the graduation halfway between the figure 5(50) and 6(60) on the graduated circle around the outside of the compass case. Then clamp the movable ring with the screw at *h*. Now hold the compass horizontally and carefully turn about until the dial-needle points to the radiolite marker *c* on the movable index ring. The magnetic-azimuth course of  $55^{\circ}$  is now indicated by the radiolite markers *j*. On a dark night it may be necessary for another soldier to move forward to the limit of visibility while from the rear you use the compass to direct his movement to the right or left in the proper direction. While still in sight of you your comrade halts, waits for you to come abreast, and then repeats as necessary.

149. The compass may be used in a number of ways, all of which can be practiced by you until you are thoroughly proficient in its use.

## SECTION II

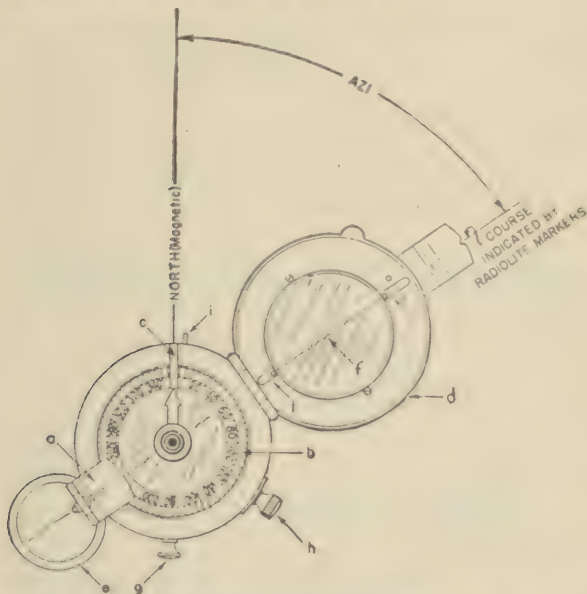
### USE OF MAPS

150. The ability to read a map quickly and accurately is of great importance to you as a soldier. With this ability, and a map in your possession, you will always be able to locate yourself in unfamiliar country. You will be able to accomplish your mission without wasting valuable time in searching for your destination, and you will be able to return to your commander in time for the information you have obtained to be of value to him.

151. Map reading is not difficult. It is nothing more than the ability to get a clear idea of what the ground looks like from seeing a map of that ground. You will probably receive further instruction from your officers in map reading, but if you have a good grasp of the following simple facts you can feel confident that you know how to understand and use military maps.

152. *a.* A map represents a part of the earth's surface shown on paper. Maps are drawn to scale. This means that a certain distance on a map always represents on that map a certain distance on the ground. For example; suppose the scale of a map is 1 inch equals 1 mile. This means that if, with a ruler,

you find that on the map, the distance between two towns, A and B, is 1 inch, you would actually travel 1 mile if you walked in a straight line from A to B on the ground. If the distance between towns C and D on this map is 2 inches then we immediately know that actually these two towns are twice as far apart on the ground as A and B.



**Figure 35. Prismatic Compass, Showing Compass Open for Measurement of Azimuth at Night by Means of Radiolite Marker.**

b. Scales are usually shown on a map in one of three ways, as follows:

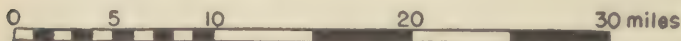
(1) They may be shown by a single or double line, divided into parts. Each part is marked with the distance which it represents on the ground and may be expressed in feet, yards, or miles. This is the way the scale is shown on automobile road maps, with which you are familiar (fig. 36A).

(2) The scale may be stated in words or figures, as 3 inches=1 mile. As explained above, this means that 3 inches on the map equals 1 mile on the ground (fig. 36B).

(3) The scale may be expressed as a "representative fraction" (called *RF*), which is merely a fraction in which the numerator (above the line) is a certain distance on the map, and the denominator (below the line) is the corresponding distance on the ground. Suppose the scale of our map is 1 inch

equals 1 mile. We could write the fraction  $\frac{1 \text{ inch}}{1 \text{ mile}}$ . For con-

venience, however, we always write *RF* with both the numerator and denominator in the same unit. Since we know there are 63,360 inches in a mile, we can write *RF*  $\frac{1 \text{ inch}}{63,360 \text{ inches}}$  and, by omitting the word "inches," we have  $\frac{1}{63,360}$ . So when we see a map with the *RF*  $\frac{1}{63,360}$ , or written as a ratio 1:63,360, we know that 1 inch on the map equals 1 mile on the ground (fig. 36C). In the same way, if we have a map with the *RF*  $\frac{1}{10,560}$  we can change the fraction to  $\frac{6}{63,360}$  and we see at once that the *RF*  $\frac{1}{10,560}$  is the same thing as though it were written 6 inches equal 1 mile.



## A GRAPHIC SCALE

**3 INCHES = 1 MILE**

## B WORDS & FIGURES

$\frac{1}{63,360}$  OR 1:63,360

## C REPRESENTATIVE FRACTION (R.F.)

Figure 36. Scales.

153. On practically all military maps which you will handle, the north is at the top of the map. On many maps the north is also shown by an arrow, which points in that direction. Sometimes two arrows are used. The arrow with a full barb, or a star at the end, points toward the north pole or true north. The arrow with a half barb points toward what is

known as the magnetic pole which attracts the compass needle.

154. *a.* Your map is said to be "oriented" when the north and south arrow on the map points north on the ground. This makes all lines on the map parallel to corresponding lines on the ground. Your map should always be oriented whenever you use it. It is just as awkward to attempt to use an un-oriented map as to read a book with the pages turned upside down or sideways.

*b.* There are two simple and easy ways of orienting your map—

(1) Suppose there are two points on the ground that you can also locate on the map. Draw a line on the map between these two points which we will call X and Y. Stand at point X. Sight along the line X-Y on the map and turn the map until the line of sight points exactly at Y on the ground. Your map is then oriented.

(2) You may also orient your map by compass. Turn the lid back and down and place the hair-line along the magnetic north-and-south line of the map, the lid lying to the north. Turn both the map and compass, keeping the hair-line over the magnetic north-and-south line on the map, until the compass needle points in exactly the same direction as both lines. Your map is then oriented (fig. 37).

155. You are said to be oriented when you know your own position on an oriented map and the directions on the ground. Suppose you have been proceeding on a mission over unfamiliar ground and you are not now sure of your location on the map. Orient your map. Select a feature of the terrain, such as a hill, and from that feature draw a line on the map toward yourself. Now do the same with reference to another terrain feature. The point where these lines cross or intersect will be your location on the map.

156. *a.* One of the most important features of map reading will be your ability to determine quickly and accurately the positions of various features on the map. A simple and easily understood method is used in our Army which will help you to do this. It is known as the system of rectangular coordinates or the "grid system." A series of parallel east-and-west and north-and-south lines are placed on the map and divided into a number of squares. This series of lines is called a "grid." The interval between these lines is usually 1,000 yards, that is, each square is 1,000 yards on a side. (See fig. 38.)

*b.* Beginning at the lower left hand, or southwest corner, the lines of the grid are numbered. The lines running north and south are numbered in order from left to right, that is, from west to east. In the same way, the lines running east and west are numbered from bottom to top, that is, from south to north. These numbers are placed on the margins of the map.

*c.* Now it is very easy to designate any square on the map by giving the numbers of the lines which intersect at its lower left hand corner. For example, the square containing the point B would be designated by giving first the north-south line and next the east-west line, with a dash between them and inclosed in parentheses, thus (152-267). But since,

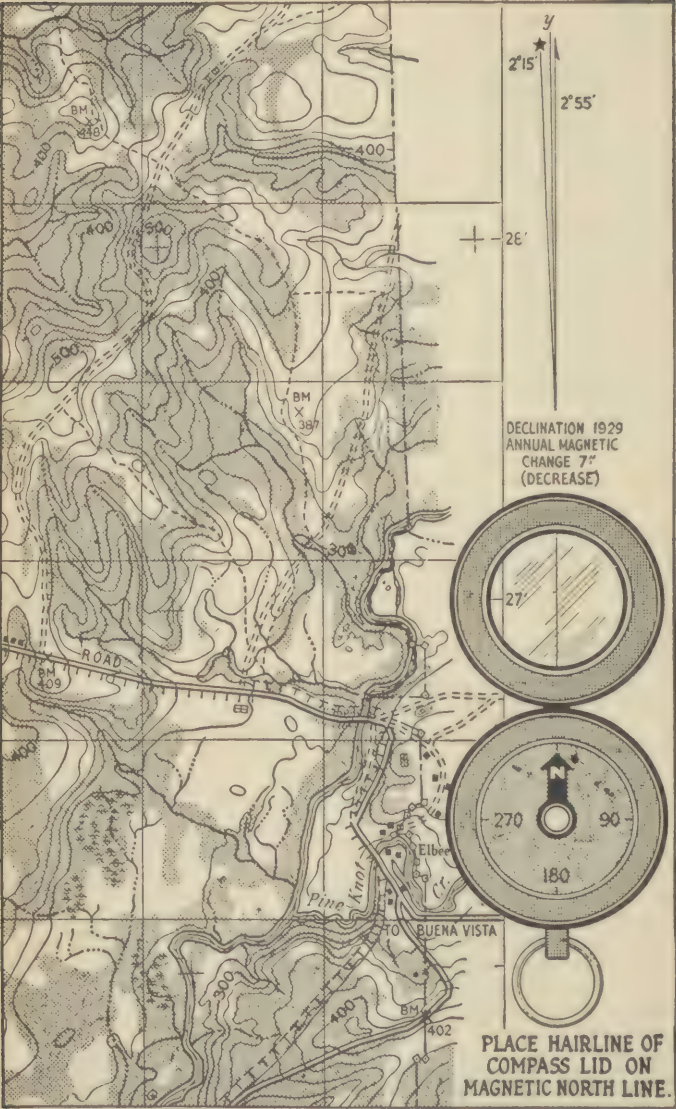


Figure 37. Orientation by Compass.

on this particular map, all the north-south lines start with 15, and all the east-west lines with 26, we can omit the 15 and the 26 and designate the square containing the letter *B* as (2-7). This expression (2-7) is called the rectangular coordinate of the square containing the letter *B*. The principal thing for you to remember is that you read **first** the number of squares to the right of the southwest corner of the map and next the number of squares up. A simple rule is: *Read right up.*

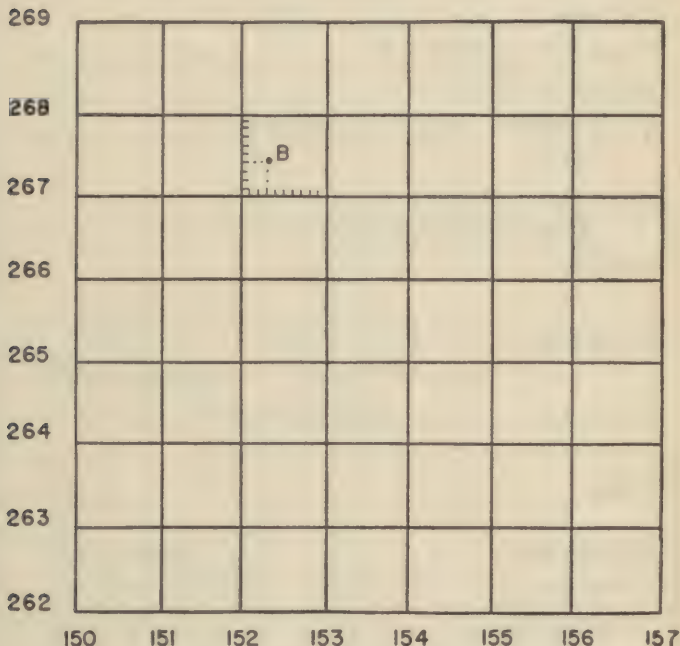


Figure 38. Rectangular Coordinates.

*d.* But suppose we wish to designate the point *B* more closely than by just giving the coordinates of the square in which it lies. Divide the sides of the square into ten equal parts as shown by the dots in figure 38. Now we see that *B* is three subdivisions east of the line 152 and four subdivisions north of the line 267. Therefore, the coordinates of *B* are (152.3-267.4) or (2.3-7.4). Become familiar with the system of reading and designating map features by means of coordinates as rapidly as possible.

**157. a.** You will probably remember the maps contained in your school geographies, as well as the common automobile road maps. On these maps certain signs, such as dots, are used to represent cities; other signs, such as wavy lines, repre-

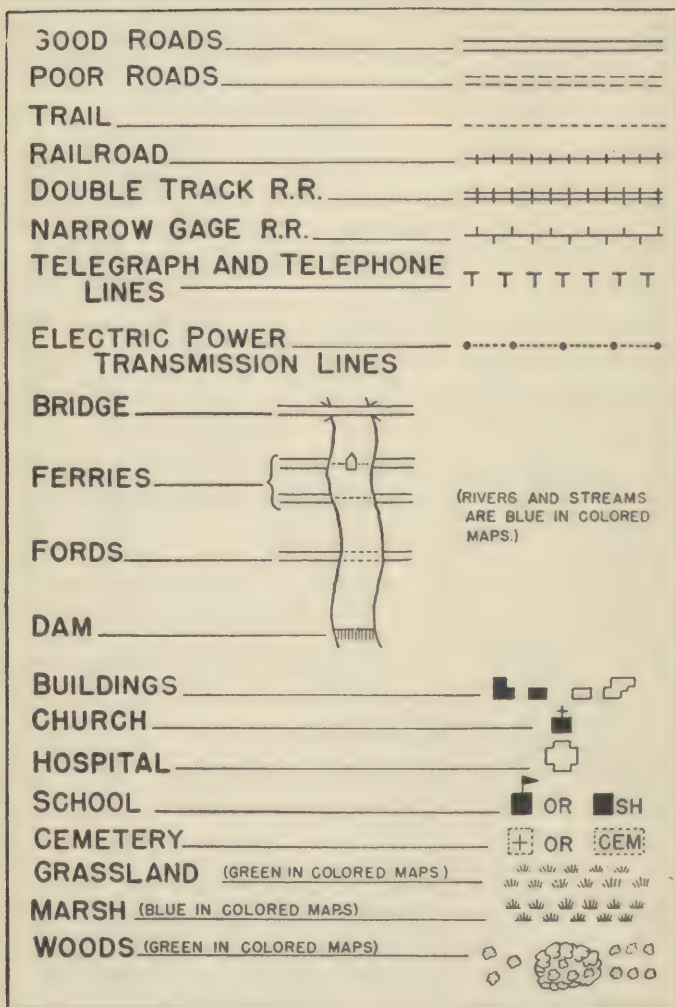


Figure 39. Conventional Signs.

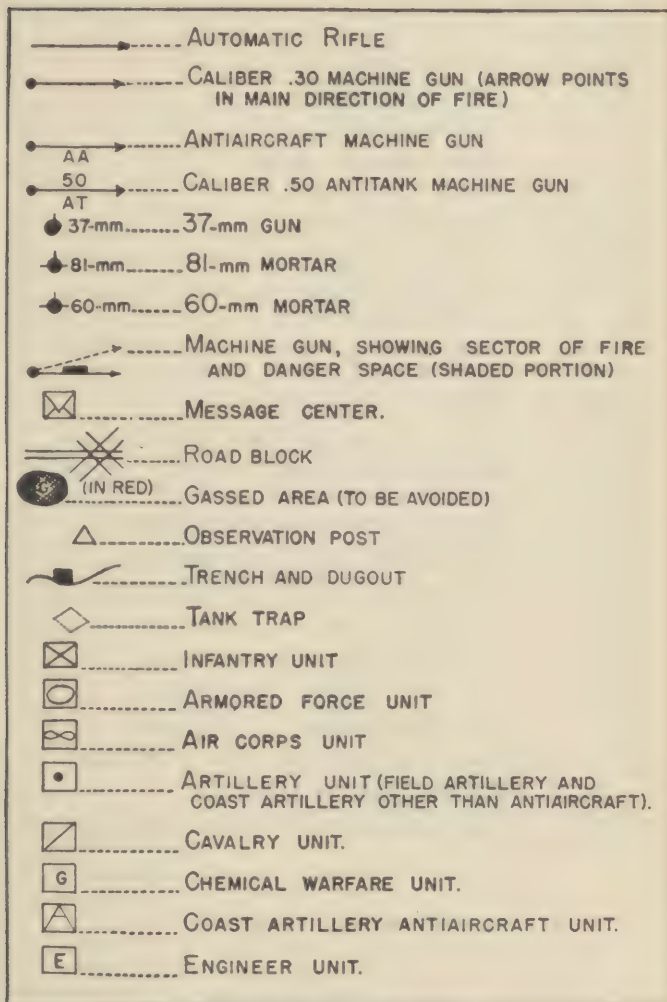


Figure 40. Military Symbols.
























	.....	MILITARY POLICE UNIT.
	.....	MEDICAL UNIT.
	.....	VETERINARY UNIT.
	.....	ORDNANCE UNIT.
	.....	QUARTERMASTER UNIT.
	.....	SIGNAL CORPS UNIT.
	.....	ONE SQUAD, COMPANY A, 48TH INFANTRY.
	.....	1ST PLATOON, COMPANY A, 48TH INFANTRY.
	.....	LIGHT MACHINE-GUN SECTION, COMPANY A, 48TH INFANTRY.
	.....	MACHINE-GUN PLATOON, CALIBER .30, COMPANY D, 48TH INFANTRY.
	.....	TROOP A, 16TH CAVALRY.
	.....	SPECIAL WEAPONS TROOP, 16TH CAVALRY.
	.....	MACHINE-GUN TROOP, CALIBER .50 16TH CAVALRY.
	.....	COMPANY A, 1ST ARMORED REGIMENT (L).
	.....	BATTERY B, 5TH FIELD ARTILLERY.
	.....	BATTERY B, 104TH COAST ARTILLERY (AA).
	.....	BATTERY B, 68TH FIELD ARTILLERY (ARMORED).
	.....	2d BATTALION, 48TH INFANTRY.
	.....	7TH OBSERVATION SQUADRON.
	.....	6TH QUARTERMASTER REGIMENT.
	.....	COMMAND POST, 8TH FIELD ARTILLERY.
	.....	MEDICAL UNIT IN OPERATION.
	.....	AREA OCCUPIED BY COMPANY A, 48TH INFANTRY.

Figure 40. Military Symbols—Continued.

sent rivers and the boundaries of states or counties. Signs of this kind which are used to represent cities, rivers, boundaries, mountain ranges, and similar features are known as "conventional signs." Military maps are usually of larger scale and contain many more details than those commonly met with in civil life. Therefore, to represent all the information set forth on them, it is necessary to use many more conventional signs than you knew in your school geography. Some of the most common conventional signs you will find on military maps represent roads, bridges, houses, fences, crops, and form lines.

b. These form lines are called "contours" and represent the variations of the earth's surface caused by hills, ridges, valleys, and the like. The exact shape and condition of the ground have a great influence on all military operations. The map, therefore, must give the person who uses it a clear picture of the shape of the ground. Since the map is flat, special conventional signs are necessary to show these different shapes. A contour line represents an imaginary line on the ground, every part of which is at the same height above sea level. If you walk along a contour line you neither go uphill nor downhill but always stay on a level.

c. You should be able to identify at any time the conventional signs shown in figure 39.

158. It often becomes necessary to put on a map either the location of various bodies of troops, such as companies, battalions, or regiments; or command posts, observation posts, trenches, machine guns, boundaries, or other important data. To do this a special list of conventional signs has been prepared called military symbols. When put on a map, blue is used to designate our own forces and red the enemy. A few of the commonest are shown in figure 40.

## CHAPTER 12

### SECURITY AND PROTECTION

	Paragraphs
Section I. General .....	159-162
Section II. Security of individuals .....	163-170
Section III. Security of small units .....	171-178

#### SECTION I

##### GENERAL

159. Most of the people you know in civil life probably make an effort at some time or other to save money. They may do this in various ways, such as putting it in the bank, investing in stocks or real estate, or buying different kinds of insurance. With money in the bank and insurance against accident, fire, or death they are relieved of worry as to what will happen to them or their families in case they should lose their jobs or suffer other misfortune. Their savings, investments, or insurance are their protection against the uncertainties of the future.

160. You are also familiar with the police and fire departments in your city or town. They are provided to protect you and your fellow citizens from the dangers of fire or the acts of dishonest persons. In many homes or farms that are beyond the city limits, watch dogs serve the same purpose.

161. All of these things give you, your family, and friends a feeling of safety. They relieve you of anxiety or worry and make you feel secure in the knowledge that misfortune cannot take you by surprise, for you are prepared to meet it.

162. Security in the Army is exactly the same thing except that instead of protection against fire, theft, or loss of a job we protect ourselves against the actions of the enemy. Each individual soldier and each organization take measures to prevent the enemy from taking them by surprise. No matter how thorough these measures seem to be, however, no individual or organization can ever afford to dismiss completely the possibility of unforeseen action by the enemy. On the other hand, if the security measures have been as carefully planned as possible, we are relieved of a great deal of anxiety and worry. We feel confident that we will be warned in sufficient time to take the necessary action before the enemy can seriously annoy us or interfere with our movements. Thus we are able to give the greater part of our efforts to the main job. When we can do this we are providing for our "freedom of action."

#### SECTION II

##### SECURITY OF INDIVIDUALS

163. *a.* The first thing for you to remember is that in a campaign security is *always* necessary. This is true whether you are resting, marching, or actually fighting. You must always be on the alert for the movements or actions of the enemy, for the sooner you see them and give a warning the

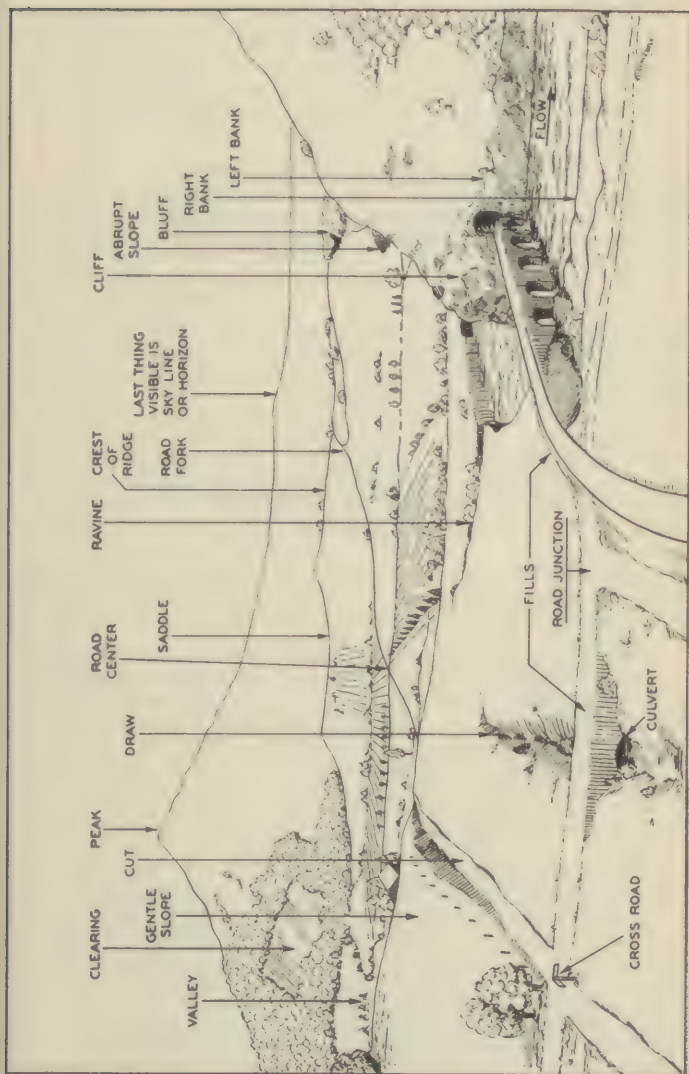


Figure 41, Military Features of Terrain.

better chance you and your commander will have to protect yourselves and retain your freedom of action.

b. During combat you may be required to serve as a scout, observer, sentinel, listener, sniper, messenger, or a member of a patrol. You may have to move about on the battlefield and work your way close to the enemy both by daylight and by darkness. In order to follow directions and report what you see, you must be able to recognize and use the military terms for different features of the terrain, such as valley, gentle slope, ravine, cut, and others. The terms which you will use most often are shown in figure 41.

c. Before you can be expected to help provide security for your organization, however, you must first know how to provide for your own security and protection. There are two ways in which you do this: the first is by learning how to move and remain concealed, or protected, from enemy observation and fire by making use of the ground; the second way is by the proper use of your weapons and equipment.

**164. Conduct of Individuals.** a. In whatever arm or service you may be you must have a knowledge of the proper use of cover and concealment. You can never know when you may find yourself in a situation where you will have to apply this knowledge in order to save your life. In the military sense, to be "concealed" means to be hidden from view, but not necessarily protected from enemy fire. Concealment affords protection only when the enemy does not know that the terrain feature is occupied. "Cover," on the other hand, means that you are both concealed and protected against enemy fire.

b. Concealment may be provided by a bush or tall grass; cover may be a trench, fox hole, a building, an air-raid shelter, an armored vehicle, or the side of a hill away from the enemy.

c. You are provided with an olive-drab uniform because that color blends in with the colors of nature and is difficult to see even at a short distance. If there is not sufficient natural concealment at hand, you can still further increase the concealment which your uniform affords you by using leaves, grass, nets, sacking, or other material which may be at hand. No piece of your equipment should glisten in the sun. When the ground is covered with snow concealment may be provided by wearing a cape or jacket of white sheeting.

d. In observing, take the position which will most reduce your exposure to enemy view. Whenever possible this should be the prone position. Keep off the skyline and avoid taking cover behind single trees and bushes which stand out against the skyline or are in sharp contrast to the surrounding terrain. When observing from woods or a building, keep back in the shadows (figs. 42 and 43). You should look and fire around the right side of trees or other concealment.

e. When in the open, lie motionless with your body stretched out flat against the ground. To observe, lift your head slowly and steadily. Hostile eyes may see abrupt and quick movements.

f. If you must move to a new position for better observation,

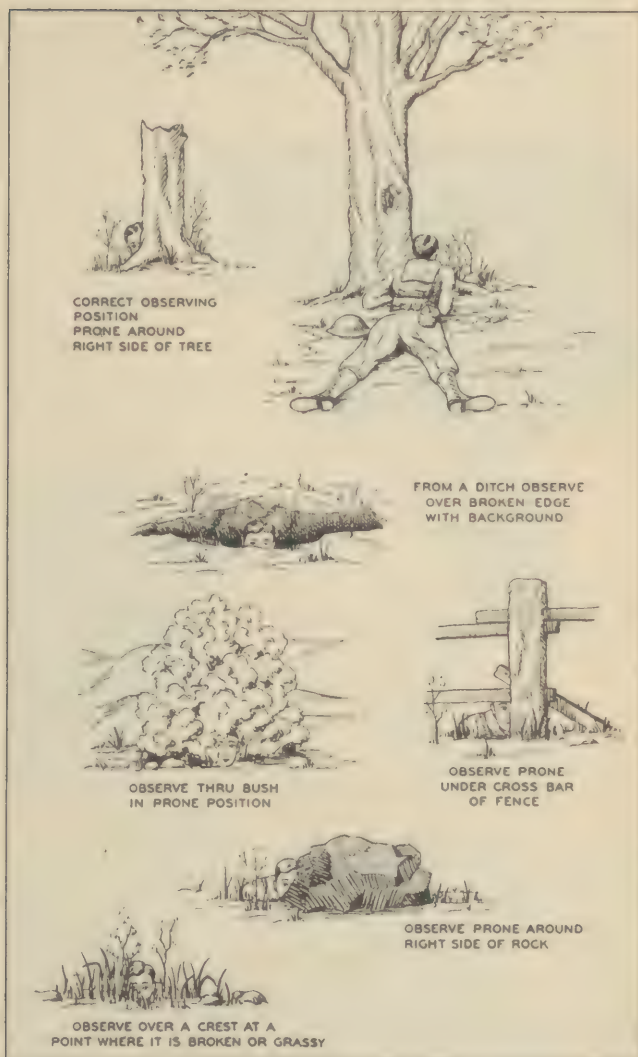


Figure 42. Correct Use of Cover.

select your route carefully before you start. If your route carries you over open ground, spring up, run at top speed with body bent low to your next cover, and remain motionless (fig. 44).

g. If a wall or hedge is available, move behind it, keeping well out of sight. If you have a slight rise of ground between you and the enemy, crawl with all parts of your body close to the ground.



Figure 43. Observing Positions, showing Correct Occupation.

h. Before starting toward a new position, pick out those places around you where the enemy may be located and then move as though you were being watched from these places. Observe the new position closely to see that an enemy is not concealed there. In searching an area look first at the ground nearest you. Look carefully at every place that may afford an enemy concealment. Search a narrow strip close to you from right to left parallel to your front. Then search a second strip a little farther away but overlapping the first. Keep this up until the entire area is carefully covered (fig. 45).

i. Know where you are at all times and do not become lost or confused as to the direction of your own troops. Remember all that you see, and report exactly what you have seen when you rejoin your organization.

j. If your duties require you to move close to the enemy

lines at night make sure that no piece of your equipment will glisten in the light of a flare, or make a jingle or other telltale noise when you move. Cover the luminous dial of your watch.

k. In movement at night it is just as important as in the daytime to keep off the skyline and make use of shadows. If you are able to creep, crawl, and cross wire silently you will



Figure 44. Method of Approaching an Observing Position.

make good progress at night, as you will be unseen. You must learn to distinguish different types of noises such as men digging with shovels, cutting wire, and walking. Also the sounds made by helmets and equipment when struck by wire and brush. Stop often and listen.

l. If you hear the sound of a flare, drop to the ground and remain motionless before the flare bursts. If you look at a bursting flare you will be blinded momentarily. If possible,

inspect by day the area you will move over at night. Select your route out and back, and carefully note all features of the terrain that will assist in guiding you at night. Take advantage of any sound, such as firing or wind, to cover the noise of your movement and move boldly. Consider all people or sounds beyond your own lines as hostile.

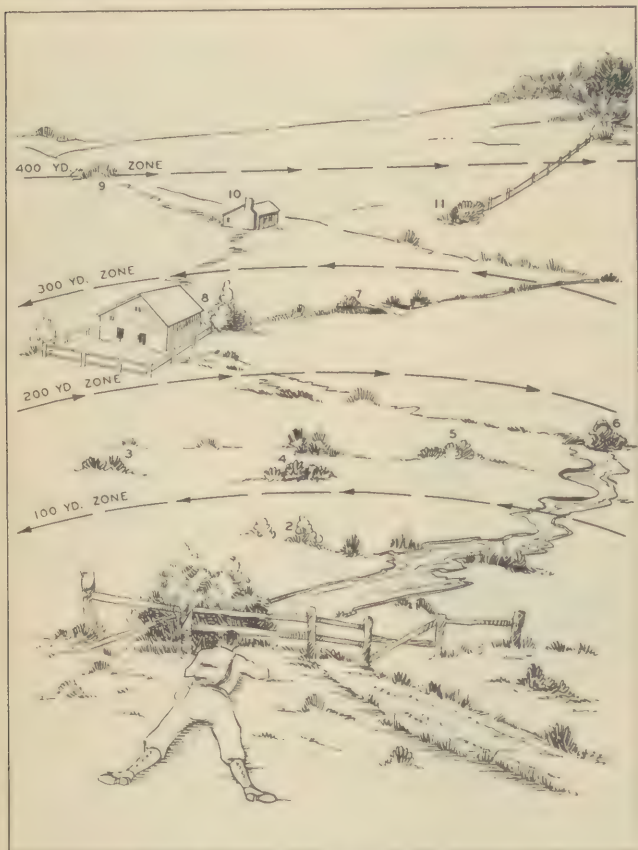


Figure 45. Method of Searching Ground.

m. During combat if you should be wounded and able to walk, report to your commander, turn over your ammunition, and leave the battlefield alone. *Unless you have been detailed for that purpose, do not carry wounded men to the rear without a written order from an officer.* That duty will be performed by medical or specially detailed personnel.

n. If you become separated from your own unit, report to

the commander of the nearest organization and fight with it until the action is over. Then ask for a written statement that you were present with the organization and present it to your unit commander when you rejoin.

o. If you should be made a prisoner remember that by the international rules of warfare you are required to give *only* your name, grade, and serial number. Answer no other questions and do not allow yourself to be frightened by threats into giving any information. Any facts about our troops or equipment may be of great interest to the enemy and result in defeat to the Army and death to your comrades. Do not give false answers to questions, as they are dangerous; merely refuse to answer.

p. Do not take into combat letters, diaries, or other written papers. If maps or documents have been given to you, destroy them if it appears that you cannot escape capture.

q. Remember that acts of violence against peaceful civilians and the damaging or looting of property are forbidden. They are punishable by trial before a military court. Prisoners and enemy wounded are not to be mistreated nor is their property to be taken from them. If civilians adopt hostile acts against you, force may be used to resist them.

**165. Sentinels.** a. A sentinel may be posted by a unit to insure its safety or readiness for action, or he may be a part of a security detachment sent out to protect a larger body. If you should be posted as a sentinel, you must be on the job every minute you are on post. You should have the following information, obtained from the person who posted you:

(1) Direction and probable route of approach of the enemy.

(2) Sector you are required to watch.

(3) Names of terrain features of military importance within sight (villages, roads, streams).

(4) Location of the nearest security detachments on the flanks and the means of communicating with them; number and location of your own outguard or security detachment, its support, and the routes to them.

(5) Whether patrols or other friendly troops are operating to your front. If so, any signs or signals of recognition or other means by which you can identify them, especially at night.

(6) Other special signals.

(7) Instructions concerning challenging.

(8) What you will do in case of attack.

b. If practicable, you will be provided with field glasses and a means of signaling. You should place yourself where you can see your assigned sector at all times and not be seen by the enemy. If possible, in the daytime you should also be able to see the sentinels on your flanks. A position in a tree may be just what you want. If you see signs of the enemy, notify your commander at once. In the daytime you should let pass only officers, noncommissioned officers, and detachments that you recognize. Stop all you do not recognize and call your commander, who will make the necessary examination of their passes. At night when persons approach your post halt them and call your commander. When halting



Figure 46. Sentinel on Duty.

anyone keep him covered. If a person fails to stop at your third command to halt, or attempts to escape or attack you, shoot him. If the enemy attacks or there is other great danger, give the alarm by firing rapidly. You do not need to challenge if you are certain you have recognized the enemy. If deserters or a small hostile party displaying a white flag approach, make them lay down their arms; call your commander. Pass on to the sentinel who relieves you all information and instructions relating to your post. (Fig. 46.)

**166. Messengers.** At any time during active operations you may be called upon to deliver a message. It is your duty to deliver it in the shortest time possible. If you should delay, it may mean the defeat or capture of your unit. Before starting out repeat back the message, if it is an oral one, to the person who gave it to you in order to fix it firmly in your mind. Ask questions about any points that are not clear and be sure that you thoroughly understand what is expected of you. Next, locate yourself on the ground and map, if you have one, and select land marks to help you find your way. In order to accomplish your mission it will generally be necessary for you to take full advantage of the concealment afforded by the ground, as has been explained in paragraph 164. Be especially careful not to make careless movements which would enable the enemy to locate the station sending the message or the one receiving it. By using different routes in entering and leaving message centers and command posts you will avoid marking out paths which can easily be seen from the air. If necessary, ask any troops you pass the whereabouts of the person or headquarters for whom your message is intended. If you should be delayed or lost, show or explain your message to an officer and ask his advice. Any information of importance you may have obtained along your route should be reported to the person to whom you are delivering the message. Be sure that you explain to him what you have seen and heard yourself and what has been told you by someone else. After delivering your message and before returning, ask if there are any messages or orders to be taken back. Upon your return to the place from which you started report that you have accomplished your mission.

**167. Connecting File.** Connection between the different parts of a marching column or between the detachments of a unit is maintained by connecting files. In a marching column a connecting file usually consists of two men. One keeps in touch with the element in front, the other with the rear. They halt only when the element in front halts or upon signals from the rear. They repeat signals from front to rear. The distance between connecting files is usually about 100 yards by day. At night, or when there is poor visibility, the distance is decreased to the limit of visibility. If you are a connecting file the principal thing to remember is to regulate your movements so that you can always see the other connecting file as well as the groups ahead or in rear of you. You should see that the element following takes the correct road. This will require especial care in turning off a road in forests, towns, or villages, and in darkness or fog.

**168. Antiaircraft Security and Protection.** *a.* As long as the enemy has any combat aircraft which will fly, our troops may expect to be attacked from the air. To provide security against such attacks each ground unit establishes antiaircraft lookouts to watch for enemy airplanes and warn the troops. These lookouts are provided on the march, in shelter, and in combat. They may remain at one post, march abreast of the marching unit, or move from one post to another by motor vehicles. If you are detailed on this duty you should observe in every direction, and especially that from which attacks are to be expected. The direction of the sun, or of hills, woods, or other cover which might screen low-flying attacks until they are close to your unit is particularly dangerous. Antiaircraft lookouts usually work in pairs and relieve each other at intervals of not more than 15 minutes. They are equipped with field glasses and sun glasses and instructed as to the alarm signal to be used. They are trained to recognize hostile as well as friendly airplanes. The alarm is given as soon as low-flying airplanes are seen which are not positively identified as friendly. Observers stationed at our antiaircraft weapons and at command and observation posts will be on the watch for signals from the antiaircraft lookouts.

*b.* In case of a daylight air attack, *never attempt to escape by running.* The plane probably has not seen you before but is sure to see you when you run. Your best protection is to lie flat on the ground. A ditch, shellhole, depression, or shadows along the road will give you good protection. When attacked from low altitudes, unless you have received definite orders not to fire, every soldier should fire on the enemy planes with rifle, automatic rifle, and machine guns. This will cause the enemy airplanes to keep above the range of small arms fire.

*c.* Dense woods provide complete concealment from aircraft and it is doubtful that you will be seen even in sparse woods provided you do not move around. If you are to be in the open for some time you can conceal yourself by pulling branches or bushes over you, which will blend with the landscape, and by *lying still.*

*d.* At night enemy airplanes may drop flares to light up the ground. When a flare is first dropped, it glows for about a second and then burns brightly. When you see that a flare has been dropped, stop where you are and remain motionless until it has burned out.

**169. Antitank Security and Protection.** *a.* To give warning of the approach of enemy tanks or armored vehicles, antitank lookouts are provided. Sometimes the same lookouts will watch for enemy aircraft as well as tanks and armored vehicles. Prearranged sound and visual signals are used to warn our troops. The approach of tanks may be suspected by the noise of their motors and tracks or by unusual columns of dust. When your unit is at a distance from where the enemy is known to be, the probable approach of tanks or armored vehicles will be over roads. When you are close to the enemy, however, the entire area to your front must be watched.

*b.* For the same reason that you should not run from an airplane attack do not run from an attack by enemy tanks or armored vehicles. You can't run fast enough to get away

from them and they are sure to see you and have a much better shot at you than if you remained still. If you are with your unit, upon seeing or hearing the antitank warning signal, await orders from your commander.

c. If you are alone, your best protection from vehicles of this kind is to take advantage of natural obstacles that they cannot cross. These are deep streams, canals, or other bodies of water, marshes or boggy ground, deep ditches or ravines, thick, heavy woods, stump land, and ground littered with good sized boulders.

d. You will also be safe from these vehicles in a trench or "fox hole" if you get down below the surface of the ground and allow the tank to pass over you. If you get a chance to shoot at the tank, aim at the vision slots or other openings but withhold your fire until the vehicle is at close range. If the belly of the tank is exposed you have a good chance of shooting through it with your .30 caliber armor piercing ammunition. Hand grenades have been used to good effect against armored vehicles, as well as bottles of gasoline which will break on the vehicle and set it afire. Above all, remember that armored vehicles can be stopped and destroyed, so don't be panicky when they approach your position.

**170. Protection Against Gas.** a. Gas is another weapon which the enemy may use on the battlefield to gain surprise. Your security against being surprised is to learn to know when gas attacks are being made and how to use your gas mask. If you can do this, act promptly and keep cool, you have nothing to fear from a gas attack.

b. The enemy may use gas in one of the following ways:

(1) From candles and cylinders. You can tell these by the hissing sound of the escaping gas and during daylight **by the cloud of gas itself.**

(2) From gas projectors and artillery and mortar shells. Projector attacks make a big explosion, a brilliant flash, and a large cloud of smoke and dust. Artillery and mortar shells filled with gas sound almost like duds when they explode. Usually a thin haze or mist surrounds the burst for a few moments.

(3) From airplanes and tanks. The airplane bomb filled **with gas also sounds like a dud** when it explodes. If the gas is sprayed from the airplane or tank it can usually be seen.

(4) From bulk containers and chemical land mines, placed in position and exploded by electricity or by contact fuze.

**c. You should** remember the following rules as your security against gas:

(1) Carry nothing in your gas mask carrier but your **mask.**

(2) Prevent damage to your gas mask by handling it **carefully.**

(3) Keep your gas mask. You may need it at any time, and it may save your life.

(4) Give a gas alarm only when gas is present.

(5) Hold your breath after the gas alarm is given until you are sure that your mask is well adjusted to your face and that you have cleared the face piece of gas by blowing vigorously into it while holding the outlet valve.

(6) Keep your gas mask on until permission to remove it is given by an officer or a gas noncommissioned officer.

(7) Do not enter a dugout during or immediately after a gas attack.

(8) During or immediately after a gas attack keep your mask on, even if in a gasproof dugout.

(9) Remain quiet and avoid unnecessary moving around during a gas attack.

(10) Keep cool, and remember your protective equipment will save you if properly used.

(11) Remember that the enemy uses many different kinds of gases, sometimes one kind at a time, and sometimes mixed with other chemical agents, smoke, or high explosive.

(12) Remember that clothing which has been in contact with mustard gas should be removed as soon as possible.

(13) Use gloves to remove another man's clothing or to handle equipment that has come in contact with mustard gas.

(14) Remember that mustard gas remains in an area for days.

(15) Avoid all areas in which there has been mustard gas. If your duties require you to go into such an area, remain as short a time as possible even though you are wearing protective clothing and a gas mask.

(16) Remember that the best conditions for a gas attack are during a calm, in foggy or cloudy weather, a drizzling rain, and at night. Be on the alert.

(17) Avoid drinking water or eating food that has been subjected to a gas attack.

(18) Remember that all gas cases require: first, rest; second, warmth; third, fresh air.

(19) If gassed, do not talk, walk, or move about.

(20) Do not bandage the eyes of a gassed case. It is harmful and may result in blindness.

### SECTION III

#### SECURITY OF SMALL UNITS

**171.** For your commander to use his troops successfully he must first know where the enemy is and what he is doing. Without this information your commander is like a man trying to feel his way in the dark. He cannot know how to plan his attack to defeat the enemy, for he does not know where he will meet him. Nor does he know at what moment, or from what direction, the enemy may attack him and take him by surprise.

**172.** You may be detailed as a member of a detachment sent out to provide security for a larger body of troops. These detachments have different names which indicate whether the main body is resting, marching, or fighting and what the security detachment is doing. No matter what they are called, always remember that the principal mission of every security detachment is to prevent the main body from being surprised. They do this by finding out where the enemy is and what

he is doing, by giving warning of the enemy's approach, and by delaying him so that the main force can get ready to fight. They are the eyes and ears of the commander. They get back to him the information he needs to know so quickly that he will have plenty of time to make or change his plans. Another important thing to remember is, no matter how small the unit may be it *always* provides for its own security even though this security may consist of only one or two men.

**173. Scouts.** *a.* The smallest security detachment is the scout. The scout is a soldier whose duty it is to see what the enemy is doing without being seen, and to hear the enemy without being heard. The scout must be intelligent, have a strong body, great endurance, keen eyesight, delicate hearing, and an excellent memory.

*b.* As a scout your commander may use you in all types of combat operations. When your organization is in camp or bivouac, scouts are sent out from the outpost to gain information of the enemy, to prevent his scouts from gaining information of your organization, or both. When your organization is on the march, scouts perform important duties with the advance, flank, and rear guards by discovering hostile troops and promptly sending this information back so that your own commander will not be surprised. In movement by night or in dense woods, scouts serve as guides.

*c.* As your unit moves forward to the attack, scouts precede it and keep the proper direction for it to follow; they investigate danger areas before the unit crosses them, and select locations where it will be protected from enemy fire. During the progress of the attack they also protect your unit from surprise fire or counterattack by the enemy; they select and occupy firing positions and point out enemy targets.

*d.* When their organization is on the defense, scouts serve as lookouts, observers, listeners, and snipers. They may serve as members of patrols to enter the enemy lines, both by day and night, to get information of the enemy. They drive off enemy scouts and patrols who are trying to do the same thing.

*e.* A trained scout will be able to see and hear things that the average soldier does not. You must be able to pick up indistinct and motionless objects as well as moving ones. Long periods of painstaking search are often required before the position of a hostile soldier is located. As a scout you will conceal yourself as has been described in the preceding section, but as you will be "on your own" you will have greater freedom of movement.

*f.* Scouts usually work in pairs, with each scout having the utmost confidence in the ability of his fellow scout. Train with your partner and make a buddy of him so that each of you know what the other will do under any circumstances. Scouts always work in pairs when scouting in front of their organization in the advance. They move ahead of their organization as ordered by the commander. Here their duty will be to cause hostile riflemen and machine gunners to open fire and disclose their position, and to overcome resistance from small hostile outposts and patrols (fig. 47).

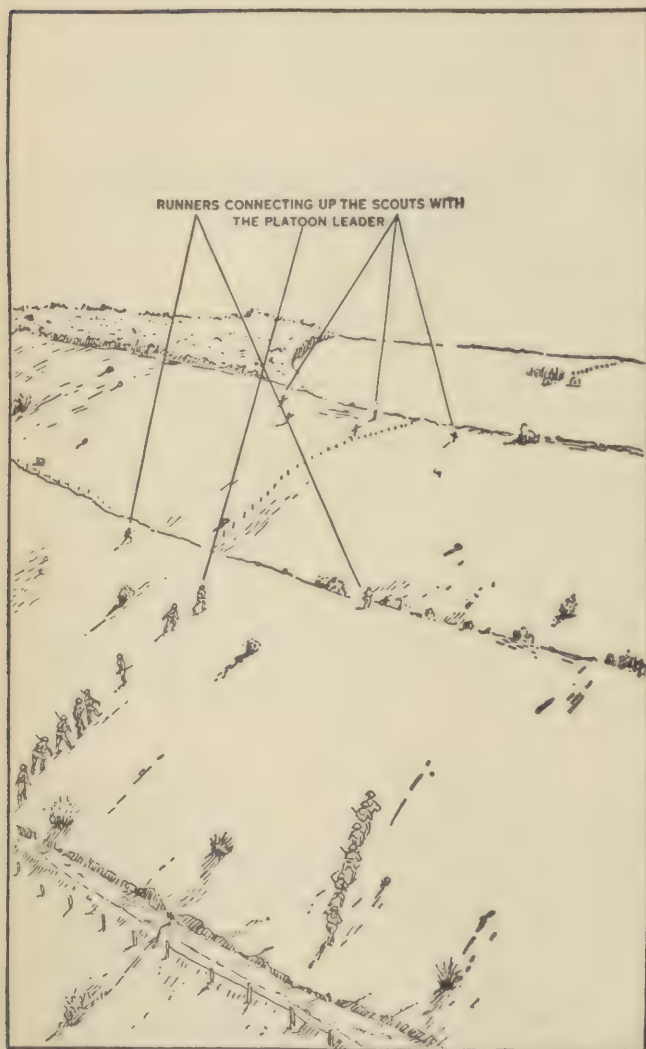


Figure 47. Position of Scouts in Advance.

g. As you scout in front of your advancing unit, pick out probable positions that may conceal enemy machine guns or rifle groups. When you signal that these positions are clear your unit will advance by bounds and you should move forward for further reconnaissance.

h. Your distance in front of your organization varies with the ground and position of the enemy. In approaching houses, woods, and villages, one scout of each pair covers while one reconnoiters (fig. 48).

i. When the enemy opens fire, stop, seek cover, and determine where the fire is coming from. Scouts open fire with tracer ammunition to show to their leader the position of the enemy.

j. Scouts must be alert for intervals or gaps in the enemy line. When you discover them, push in, take up position from which flanking fire may be brought to bear on the hostile position, then either you or your fellow scout notify your leader at once.

k. You can see that if you are appointed a scout a great deal will depend upon how well you perform your duties. You must always remember why the commander sent you out and what he wants you to do. That is your "mission." Sometimes this will require a great deal of courage on your part and you may have to try out several different plans until one of them works. You will be "on your own" and often will find yourself in a situation which neither you nor your commander could have thought of in advance. But if you remember your "mission" at this time, and just what information your commander is anxiously waiting to receive from you, you will succeed.

**174. Patrols.** *a. General.* The squad or a part of a squad often acts as a patrol. Patrols are assigned either reconnaissance or security as their primary mission.

(1) *Reconnaissance patrols* are used primarily to get information, maintain contact with the enemy, or observe points or areas. They do not fight unless they must in order to accomplish their task. They move so as best to do their job; they are not bound by either position or distance to the unit from which they were sent out.

(2) *Security patrols* provide security for a larger force. Their mission often will require them to fight. They must regulate their movements on the force or unit they are protecting.

(3) Patrols executing missions which will probably call for combat are given the means and the strength to enable them to engage in combat.

*b. Reconnaissance patrols.* (1) Reconnaissance patrols are usually small, consisting of a leader and two or three men. They avoid unnecessary combat and accomplish their missions by stealth.

(2) The patrol leader is given the enemy situation and our own situation insofar as he needs to know them. He is given a definite job to do; he is told the general routes to be followed, the friendly troops through which he will pass,

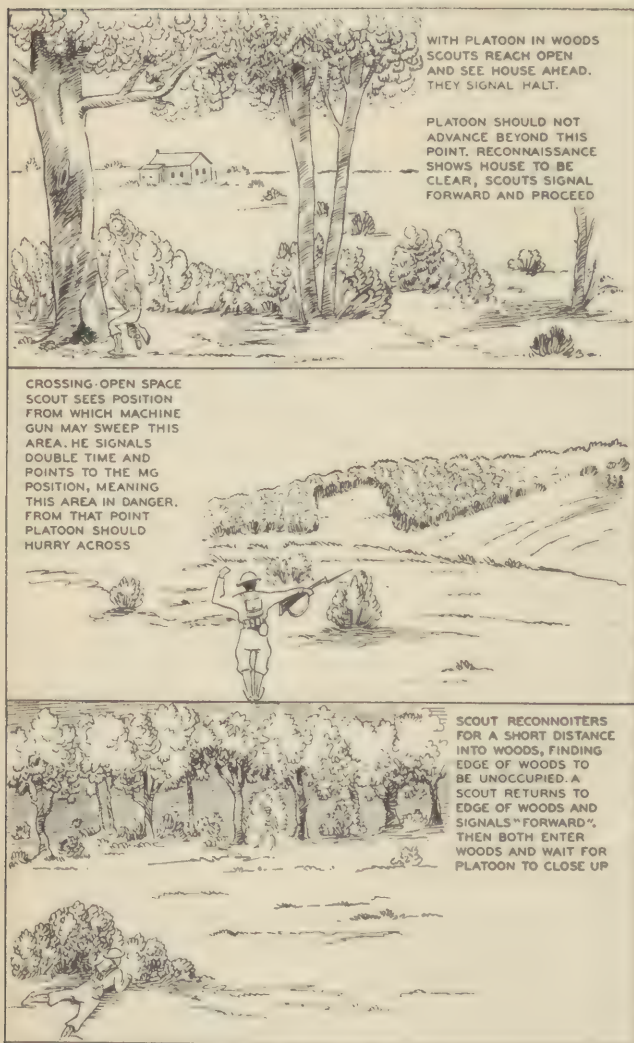


Figure 48. Conduct of Scouts During Advance.

the time of return, and the place where messages are to be sent or the patrol is to report.

(3) Before starting out the patrol leader studies the map and the terrain and selects a suitable route. He appoints alternate leaders, gives the other members of the patrol care-



Figure 49. Distribution of Patrol Halted in Observation.

ful instructions about the task the patrol has to perform, assigns individual tasks, points out the route on the map and on the ground, arranges special signals, and designates an assembly point if the patrol is forced to separate. He makes sure that all members of the patrol know their jobs and checks to see that the arms and equipment are so carried

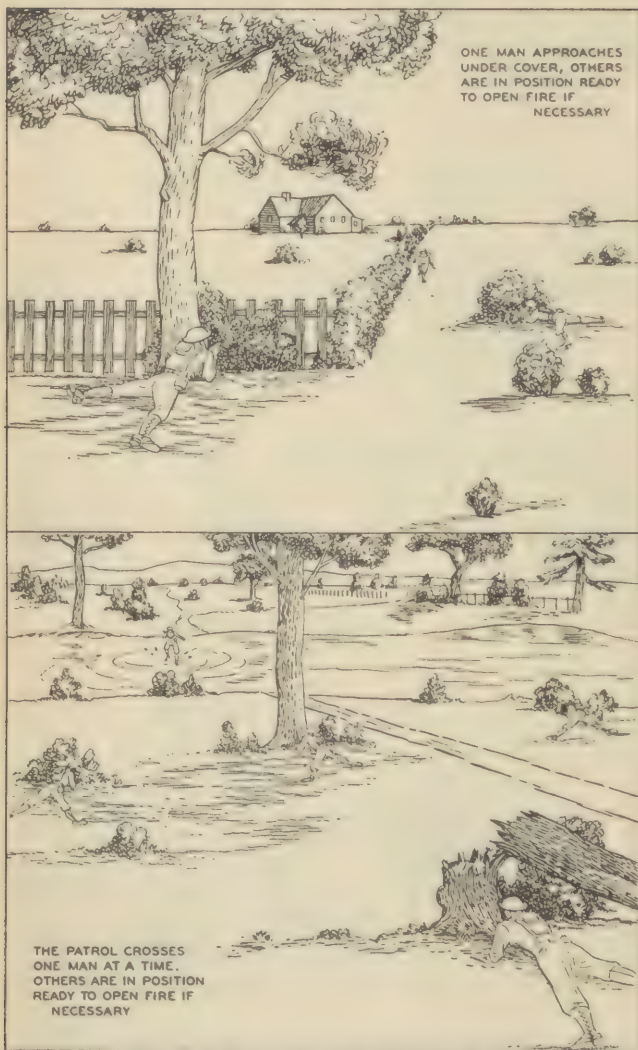


Figure 50. Method of Approaching House; of Crossing Stream.

that they will not glisten or rattle. The members of the patrol do not carry written matter which might be of value to the enemy if they are captured.

(4) All must clearly understand that in event of a fight wounded comrades are not abandoned but brought in with the patrol, whenever possible.

(5) All patrols provide for a point, flank protection, and a get-away man, who must always be able to return to his commander no matter what may happen to the remainder of the patrol. When a patrol is at a halt for any reason it must provide itself with all around protection (fig. 49).

(6) When moving in open country near the enemy, the patrol should pick its next stopping place before each advance. Moves should be made by one man at a time and at top speed. Before crossing a skyline one man should go to a point where the skyline is broken and observe, the rest of the patrol covering his advance. When he signals "forward" the way is clear and the remainder of the patrol comes up (fig. 50).

(7) Patrols should avoid enclosures and villages if possible. If it is necessary to pass through villages or to patrol them, great care must be taken, as each house or cellar may conceal an enemy. Watch windows, doors, and tops of houses closely. Advance slowly and cautiously (fig. 51).

(8) If a patrol is attacked and must fight, the man who first notes the danger calls out "Front," "Right," "Left," or "Rear." All members face toward the man attacked. The men on the flanks advance a short distance straight ahead and then close on the enemy from the flanks. The patrol leader and the men with him rush the enemy. During the combat, the members of the patrol repeat their recognition signals. If necessary, the leader designates a man near him to stay out of the fight.

(9) The patrol leader decides whether information gained will be sent back at once by messenger or reported on the return of the patrol. He alone is authorized to talk to, or arrest civilians or to seize telegrams and mail matter. Patrols do not allow civilians to pass through or precede them.

(10) An example of a message which you, as a patrol leader, might send back is shown in figure 52. After writing the message you would point out to the messenger who will carry it the location of the stone fence, woods, and machine guns and tell him your intentions. The sketch can be made quickly and requires no special ability. It contains all the information that is needed but no unnecessary information. If the commanding officer of Company A wants to know what you are going to do, he will ask the messenger. The advantage of this lies in the fact that, should the messenger and the message be captured by an enemy patrol, there is nothing in the message to tell them where Corporal Jones is now. To write "squad will remain at B" invites capture.

(11) A soldier who is a good individual scout will ordinarily be a good member of a patrol. However, it must be remembered that as a member of a patrol you must



Figure 51. Formation of Patrol Passing Through Village.

obey the signals or commands of the designated leader instantly and without fail. You are not then scouting "on your own."

(12) Since many night patrols are for the purpose of capturing prisoners and executing tasks which may require combat, the patrol should rehearse plans for night combat and laying ambushes until it reaches a high state of efficiency. Only through repeated rehearsals and training will each member of the patrol learn to do his part unhesitatingly and correctly, and thus gain confidence in the ability of the patrol as a unit (fig. 53). Failure to do this will sooner or later result in heavy losses in the patrols.


These spaces for message center only	
Time Filed	MSGCEN. NO
MESSAGE	
No. <u>2</u>	Date <u>20 Dec. 40</u>
To <u>C. O. Co. A.</u>	<div style="display: flex; align-items: center;"> <div style="text-align: center;"> <p>MG</p> <p>X ← 75</p> <p>↑</p> <p>500</p> <p>↓</p> <p>• B</p> </div> <div style="margin-left: 20px;"> <p>stone fence</p>  <p>wheat field</p> </div> </div>
<p><i>1. Enemy machine gun firing near stone fence. See one gun at MG</i></p> <p><i>2. Patrol now at B.</i></p> <p><i>3. Runner will report my future movements</i></p>	
Leader Patrol No1	9:20 A
OFFICIAL DESIGNATION OF SENDER	TIME SIGNED
<u>Jones, Corp'l.</u> Signature and Grade of writer	

Figure 52. Example of Message.

c. *Security patrols.* (1) A squad or a part of a squad may act as a point (of the advance guard or rear guard) or as a flank patrol of a force on the march or in combat.

(2) *Point of advance guard.* The point of an advance guard is a security patrol. It moves along the route of march and prevents an enemy on or near the route of march from opening surprise fire on the troops in rear. Behind the point comes the advance party. The distance

between them will vary with the kind of terrain and whether it is day or night, but usually the point will not precede the advance party by more than 300 yards. As a member of the point you will find that it is so arranged as best to let the leader control it, to make it a poor target for enemy fire, and to permit all members to fire quickly to the front or either flank. It frequently marches on both sides of the road. It fires on all hostile forces within effective range. When unable to drive off the enemy, it holds its position and covers the action of the advance party. The presence of a distant enemy beyond effective rifle range is reported by signal. The point observes toward the front and flanks but does not reconnoiter on the flanks of the route of march. When the column halts, the point sends forward one or more observers.

(3) *Point of rear guard.* As a member of a rear point you are assisting in protecting the rear of your marching column. The formation of the rear point is similar to that of the point of an advance guard. However, as a member of a rear point you stop to fire *only* when the enemy threatens to interfere with the march. No other troops will move to your assistance, but when the enemy presses closely, other troops will take up firing positions in rear to cover you. When you are forced back, withdraw to a flank so that the troops behind you can fire into the enemy.

(4) *Flank patrol.* (a) A flank patrol is a security patrol. Flank patrols operate in one of two ways; either they go to a designated place, remain there for a specified time, and there rejoin the column, or they march along a designated route. They report, by signal or messenger, enemy forces they observe.

(b) A flank patrol of a column on the march moves so that it can protect the column against hostile small-arms fire at mid ranges (300 to 600 yards).

(c) In combat the flank of the unit to which you belong may become exposed. In such a situation flank security patrols are sent out to protect the exposed flank. Not only do these patrols report observed hostile forces and their movements but they also report the movements of friendly forces which they can see.

**175. Security at Halt.** a. Detachments of troops detailed to protect a body of troops at rest or not on the march are called outposts. The general purposes of an outpost are to get information, to observe places where the enemy might sneak up on the main body, and to fight off enemy troops coming toward your position. In particular the outpost must protect the main body so the troops can rest, or work undisturbed, and in case of attack hold the enemy off long enough so that the main body can get ready to fight. If you are a sentinel on outpost duty you must be on the job every minute you are on post, but you must avoid unnecessarily alarming the command.

b. For an organization the size of a company, troop, or battery the outpost need be only a few sentinels and patrols. In a larger organization a larger and more elaborate outpost



PAIRS OF SCOUTS ATTACK  
PREVIOUSLY DESIGNATED  
MEMBERS OF THE ENEMY  
PATROL BY RUNNING IN  
UPON THEM FROM BEHIND.



A PAIR OF MEN WITH  
BROWNING AUTOMATIC RIFLES  
ARE PLACED ON EACH FLANK  
NEAR END OF AMBUSH SO THAT  
THEY CAN COVER ITS FLANKS.

Figure 53. Night Ambush.

will be needed. On account of the presence of motorized and armored forces in all modern armies, outposts must give all around protection to their commands. The part of the outpost nearest the enemy is an observation group called an outguard. Behind the outguard are more troops in detachments called supports (figs. 54 and 55).

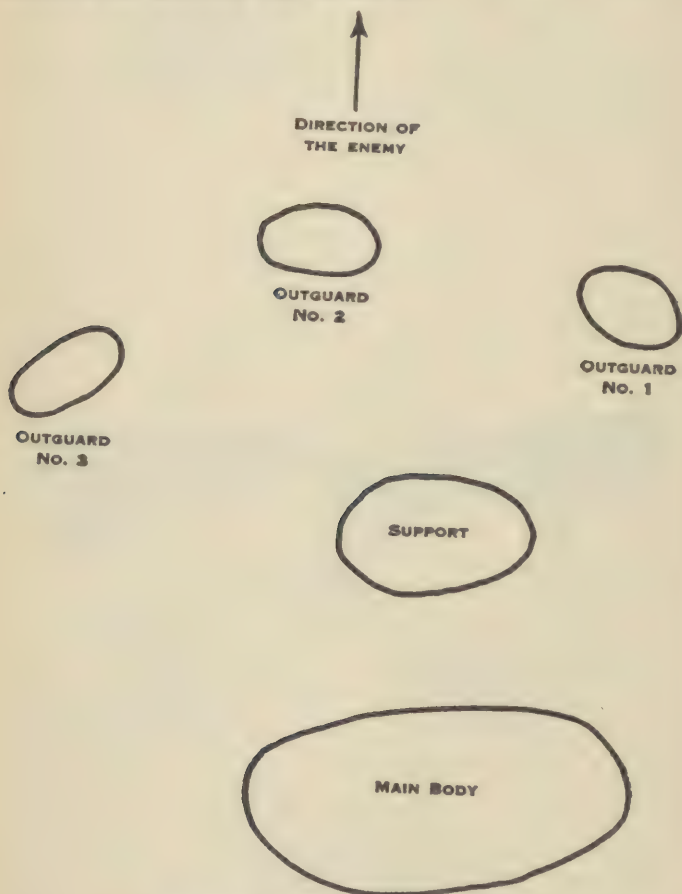


Figure 54. Outpost of Small Force.

c. If you are a member of an outguard, no fires will be built or smoking permitted unless you are told you can do so. You should avoid loud talking or making other noise. The position of each outguard may be entrenched and will be concealed. You keep your weapons at hand all the time, and do not remove your equipment. Your duties as a sentinel are described in the preceding section.

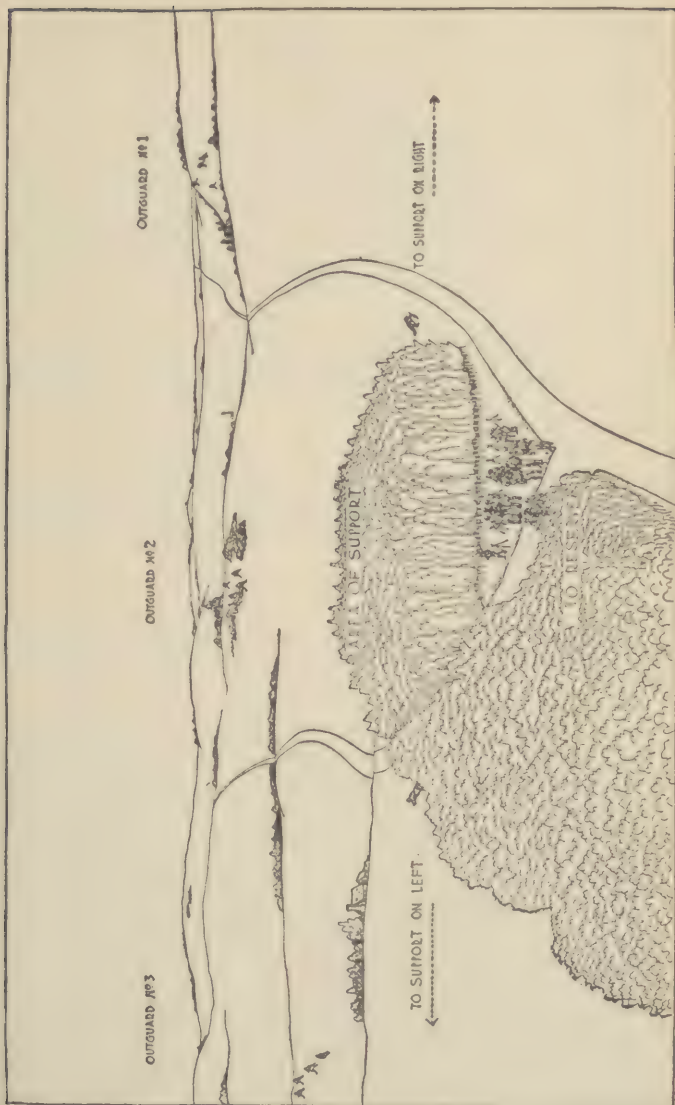


Figure 55. Several Outposts on Duty.

d. You may be called upon to perform outpost patrol duty. Outpost patrols operate either within our lines or beyond our lines. Some patrols operate beyond our lines to reconnoiter in the direction of the enemy. Other patrols operate within our lines in order to keep in touch with the parts of the outpost and check up on the performance of duty on the line of outguards. Outpost patrols have at least two men and a good leader who, on important tasks, may be an officer. The patrols get information of the ground and of where the enemy is and what he is doing. Any ground near the line of outguards that might give concealment for hostile troops is searched frequently by patrols if the enemy could get to it without being seen. When you are on patrol duty you fire only in self defense or to give the alarm. Patrols and reliefs should not move in the open in vicinity of the outguards and so give away the location of the sentinels and outguards.

e. If you have to establish a cavalry outguard, remember that your horses must be kept as near at hand as practicable. This will require careful planning so that they can be fed and watered and still be protected from enemy observation and fire.

**176. Security on the March.** a. An *advance guard* is a detachment of a body of troops that goes ahead of and protects the main body on the march. The chief job of an advance guard is to protect the main body against surprise attack and drive back small detachments of the enemy. Particularly its duties are—

(1) To guard against surprise and get information by patrolling.

(2) To push back small detachments of the enemy and prevent them from observing, firing on, or delaying the main body.

(3) To remove obstacles and make repairs to the road to help the steady advance of the column.

(4) To delay the enemy's advance in force long enough to let the main body get ready to fight.

(5) When the enemy is found on the defensive to take a good position, locate his lines, and protect the main body during its preparation for action.

b. An advance guard provides for its own security and gets information by putting out smaller detachments to the front and flank. The most advanced part of the advance guard is called the *point*. (Figs. 56 and 57.) The point is usually a squad, or part of a squad. It is really a patrol with a fixed mission.

c. Your part in an advance guard may be as a part of the point or one of the other patrols sent out to make sure that the enemy does not ambush the main body.

d. If the point of an advance guard is fired upon, it should deploy and try to continue to advance fighting. This is done in order that small enemy detachments will not succeed in delaying the advance of the main body. Flank patrols assist in this, and if the enemy does not fall back they try to locate

his flanks. If necessary, each part of the advance guard goes into action to clear the way for the main body.

e. A *rear guard* is a detachment whose job is to protect the main body from an attack from the rear. In a retreat it fires on and delays in every possible way enemy pursuing troops, so that the main body can gain distance from the



Figure 56. Relation of Security Detachments on March to Main Body.

enemy. The formation of a rear guard is like that of an advance guard, reversed. That is, the various parts follow the main body instead of going ahead of it. Also the rear party follows the support, and the rear point follows the rear party. The rear guard makes the most of opportunities to block the road and takes up good positions from which it can fire on the enemy and make him deploy. The fight is not kept up so long that the rear guard will not be able to fall back to other positions. (Fig. 58.)

f. A *flank guard* is a detachment whose job is to cover the flank of a column exposed to enemy attack. It may be placed in position to cover the march of the main body or it may march generally opposite the main body to protect it. The object of the flank guard is to prevent attack of the main body or, if this cannot be done, then to delay the enemy long enough so that the main body can get ready to fight. The flank guard must keep contact with the main body. A flank guard must provide its own protection and if necessary have its own advance guard or rear guard and flank patrols (fig. 56).

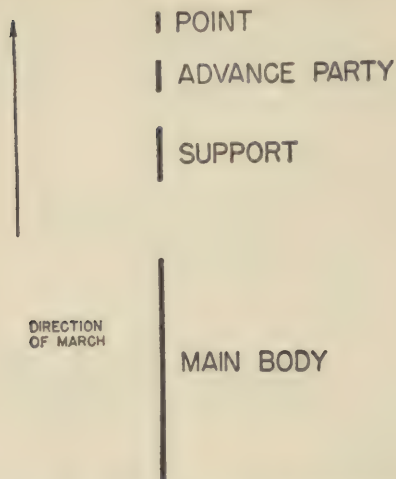


Figure 57. Advance Guard of Small Force.

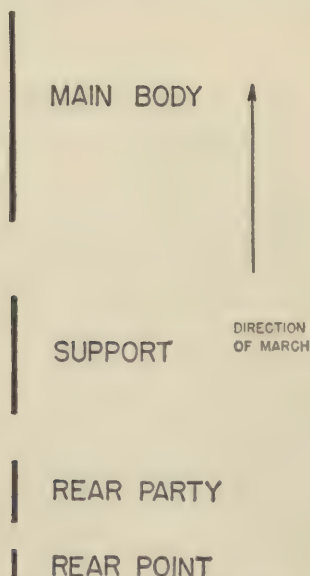


Figure 58. Rear Guard of Small Force.

g. (1) When a march is made near the enemy, special measures are taken during halts for protection against surprise or attack. When the halt is only for a short time (less than a half hour), the advance party and support rest along the route of march. The point and flank patrols move to positions where they can keep a good lookout. If necessary more patrols will be sent out from the advance party and support. Antiaircraft and antitank lookouts are detailed to watch out for the approach of enemy airplanes and tanks or armored vehicles.

(2) If the halt is longer than a half hour, a march outpost will probably be formed. Outguards are sent out to the front and flanks, and unless friendly troops are close in the rear they will be put out to protect the rear also. The outguards to the front and flanks are furnished by units of the advance guard. Outguards to the rear, when necessary, will be taken from the rear guard. When the march is to be resumed, the various outguards are signalled to close in, and when all are back in their march formations the march is resumed. March outposts watch particularly roads and routes of approach leading to the main body for the approach of enemy mechanized and motorized detachments. March outposts work like other outposts in protecting the main force.

h. All arms of the service follow the same general plan for providing security for themselves. In the cavalry, armored, or motorized units, however, the distances between the security detachments and the main body are greater than with foot troops because of the greater speed which cavalry, armored, and motorized units have. Security elements of these rapidly moving forces sometimes advance by bounds, much as a scout will do in advancing toward the enemy. That is, the point of the advance guard will move rapidly forward to some ridge or other favorable terrain feature from which it can observe toward the enemy and, if all looks well, it signals for the next larger unit to come forward. The leader of the point then selects another favorable terrain feature and repeats his advance, taking advantage of cover. While the point is doing this the next larger detachment in rear is prepared to defend the point by firing on any hostile element which might seek to stop the advance of the point. Sometimes, however, when the advance of the main body is very rapid, or during darkness or fog, movements by bounds will not be made but a steady rate maintained.

**177. Security While Defending.** a. When your organization is defending, security against a surprise attack is provided by sentinels, patrols, outguards, outposts, a warning system, and natural and artificial obstacles. The natural obstacles which provide some protection by making it difficult for the enemy to attack are rivers, canals, lakes, marshes or boggy ground, ravines, steep mountains, and other difficult parts of the terrain. They can all be crossed, however, and must be watched and defended.

b. The artificial obstacles which provide protection are trenches and dugouts, barbed wire entanglements, road blocks, road craters, traps, and mines. Just as with the natural obstacles, the enemy can remove or cross artificial obstacles if he is

not interfered with. The thing to remember is that after a natural or artificial obstacle has been selected or put in place it should be covered with the fire of your weapons, especially machine guns. The obstacles will slow the enemy up. When he attempts to remove or cross them your fire will stop him.

c. (1) There are specially organized units in the Army to provide protection against aircraft and armored vehicles. If you are assigned to one of these units, you will be given special instruction in the use of the weapons. If you are not a member of such a unit, however, you should make **every** effort to provide your own security with the weapons and other means available to you. As was explained before, your best protection against low-flying aircraft is concealment, remaining quietly in place, and firing on the airplane with all weapons unless you have received orders not to fire.

(2) Even where natural obstacles exist, additional security should be provided against armored vehicles by an all around protection of artificial obstacles. Tank traps and mines can be set out, although this will usually be done by engineers or larger troop units. Road blocks are especially effective in stopping armored vehicles or slowing them up and making them go across country. These may be easily constructed by deepening and enlarging shell holes on the road, by felling trees or telephone poles, or by putting old automobiles or trucks crosswise on the road where the armored vehicles cannot get off the road because of steep banks or ditches. The value of these obstacles is increased by covering them with fire, which will interfere with the enemy's attempts to remove the obstacles.

(3) You must be on the alert to prevent enemy sympathizers or parachute troops which have been landed behind our lines from removing these obstacles. If you are detailed to guard an obstacle, never allow any persons to tamper with it or remove it unless you are sure of their authority to do so. If there is any doubt in your mind, hold them under guard until one of your officers or noncommissioned officers arrives. If they attempt to attack you or to escape, shoot them.

**178. Security While Attacking.** a. As your unit approaches the actual or probable location of the enemy, security is provided by covering its advance with scouts. These scouts go in advance of the larger units and "comb" the ground thoroughly. Their action will make the enemy disclose his position by opening fire before the larger elements of your organization have come within his range. As your unit comes closer to the enemy's position additional security will be provided by breaking up into smaller units, known as squad or platoon columns, or by deploying as skirmishers. This increases the readiness for action of your unit by putting it into formation from which it can move in any direction and cannot be surprised by any action of the enemy. Additional security is provided by the fire of machine guns and other weapons which keep down the enemy's fire until your organization can reach his position and drive him out of it.

b. If your organization halts during the attack, one or more

combat outposts are immediately sent out to the front where they can screen and protect your organization until it is ready to continue the attack. A combat outpost usually operates from several alternate positions. If the enemy advances the combat outpost opens fire at long range. Upon close approach of the attacking troops the combat outpost withdraws. Routes of withdrawal are used which will not interfere with your own organization in rear firing at the enemy.

c. If the battle is interrupted by darkness, combat outposts will be promptly established. At night they will be closer to your organization than in the daytime. The combat outpost will establish listening posts to warn the front line organizations of the approach of hostile raiding or attacking parties. It will maintain a vigorous reconnaissance during the night in order to discover any change in the hostile dispositions, intentions, or situation.

d. During battle it may happen that a flank of your organization may be exposed. That means that there are no friendly troops close to that flank. When this happens a flank patrol must be sent out to that flank. Its duties are to prevent the enemy from working his way around and attacking your exposed flank or rear, or to give due warning of such an intention. Such a patrol regulates its own movements on that of the unit it is protecting. It may remain in one position or, if your organization is advancing, it will move rapidly from one position to another. When the patrol occupies a position each member selects two locations, one from which he can fire to the front or flank and another from which he can fire to the flank or rear. The patrol must be in constant communication with the unit it is protecting. One man is selected who must always be able to escape and get back to your organization in case the patrol is captured. Information of enemy activities or of friendly troops which may appear on that flank are reported back to your commander as he directs.

## CHAPTER 13

### MILITARY SANITATION

**179.** Before you entered the Army, you were given a thorough physical examination to see that you had no disease. Now that you have been accepted in the military service it is your duty to our country and yourself to keep well and ready for any service. If you will remember and follow the few simple rules given below, you will find yourself repaid many times. Following these rules, in connection with the daily exercise of your military training, will keep you in excellent physical condition, and you will return to civil life with a better and stronger body than when you entered the Army.

**180.** If at any time you do not feel perfectly well, or believe that you have any disease, go at once to your first sergeant, or the noncommissioned officer in charge of quarters, who will send you to a medical officer for examination. Never try to treat yourself, as you may not only seriously harm yourself, but may also become a source of danger to your comrades. The danger of giving a disease to another man is usually greatest when the illness is just starting, and often before you feel really sick. If you have a cold, a headache, diarrhea, sore eyes, a rash on your body, or feel feverish, you must be examined by a medical officer as soon as possible. Many catching diseases begin with these symptoms, so you must not wait until you have exposed your comrades before seeing a medical officer. You will also usually have a less severe illness yourself if you report for a treatment as early as possible.

**181.** Stay away from any person having a disease unless it is your duty to take care of him.

**182.** An unclean body may be the cause of disease. Take a bath at frequent, regular intervals and at least twice a week. Pay particular attention to your armpits, the parts between the legs, the feet, and under the foreskin. Always wash your hands thoroughly before eating and after using the toilet, as you may have gotten some disease germs on your hands which will get on the food you eat and into your system. You are especially likely to get such germs on your hands when going to the toilet. If bathing facilities are not available, scrub your body frequently with a wet cloth, paying particular attention to your armpits, crotch, and feet.

**183.** Have your underwear, shirts, and socks washed frequently and change them at least twice a week. If water is not available, crumple up your clothing, shake it well, and hang it in the sunlight for at least 2 hours. Be on the lookout for body lice and crab lice. If you have a continued itching on your body or head, report to a medical officer at once.

**184.** When your clothing or shoes get wet, change them as soon as possible. Sitting around in wet clothes or with wet feet is almost certain to give you a cold or other serious illness.

**185.** Keep your mouth clean by thoroughly brushing your teeth at least twice a day; one brushing should always be

before going to bed. Brush your teeth on the inside and outside, away from the gums and toward the cutting surfaces of the teeth. If particles of food remain between the teeth, they should be promptly removed, care being taken not to injure the gums. If your teeth are bad, or ache, report to the dental officer.

186. Get into the habit of having your bowels move regularly once each day at as nearly the same time as possible. Always go to the toilet to urinate, or when your bowels move. Using the ground for this purpose is a source of great danger to everyone. Flies or other insects may alight where you have relieved yourself, pick up germs, and later deposit them on food. These germs may also be carried by rain, or drainage, into wells or a stream which serves as a water supply for some city or your own camp or post.

187. Drink plenty of water at intervals during the day but do not drink a large amount at one time, especially when you are overheated after exertion. Drink from your own glass or cup, or from a bubbling fountain. Never use a cup which is used by others, as someone may have left live germs on it from his mouth or hands, and you may catch a disease when drinking from it. For the same reason do not exchange pipes, cigars, musical instruments played by the mouth, handkerchiefs, towels, or shaving outfits.

188. Be sure to use your mosquito bar when mosquitoes are present. See that it is well tucked in and that it has no holes in it.

189. Flies and cockroaches frequently carry disease germs and leave them on food and other articles over which they walk. Get rid of flies in every way. Whenever you see a fly in barracks, kill it. Be sure that screens in windows and doors are kept tightly closed. Food containers and garbage cans must be kept tightly closed. Scraps of food, fruit skins, and manure should never be left on the ground about the post or camp.

190. Keep your barracks and squad room clean. If you find bedbugs in your bed, or in the barracks, report that fact to your company commander.

191. Keep your hair cut short and your fingernails clean. This is especially important if you are detailed as a cook, baker, or in other positions in which you handle food.

192. *a.* Avoid venereal diseases. These diseases are almost always caught by sexual intercourse with an infected woman. If you have had sexual intercourse, report at once for "prophylaxis." The prophylactic treatment must be carried out thoroughly and the directions followed exactly. The sooner you report for this treatment, and *at least* within 2 hours after exposure, the more certain you are of avoiding disease.

*b.* If you should feel that you have caught a venereal disease, report to the medical officer at once and do exactly as he tells you. Any venereal disease can be cured much more quickly if proper treatment is begun early. Above all, do not try to treat yourself or go to an advertising quack doctor. Doing either of those things may result in serious damages

to your body and health which will remain with you the rest of your life.

193. While all of the rules given above are of the same importance in the field as they are in your post or cantonment, the following are of especial importance in your field service:

a. Be more careful of the water you drink. Never drink any water from a stream, spring, well, or faucet until it has been passed as pure by a medical officer and a sign posted that the water is safe to drink. When orders have been issued that all drinking water must be boiled, be sure that the water you drink has *actually been boiled for 20 minutes* and not merely heated a little. Often water will be provided for drinking which has been purified in a sterilizing bag known as a Lyster bag. These bags are usually placed in your company street or near the company kitchen. When this is done drink only the water from the bag. Do not mind the peculiar taste; it will not hurt you in the least and comes from a powder issued by the Quartermaster Corps to purify the water. Water purified in this way may make your urine sting a little but this means nothing harmful. Let the water run from the faucet of the bag into your own cup. Do not dip a cup into the bag and do not drink by putting your lips to the faucet.

b. Be especially careful not to relieve yourself except in the latrine, or the night urine can, provided in your company street.

c. Be sure that your mess kit and knife, fork, and spoon are thoroughly washed in hot, soapy water and rinsed in boiling water after they are used. Unless this is done in boiling water your mess gear may pick up disease germs from the men who used the water before you and you may contract disease.

d. Use the mosquito bar whenever there are mosquitoes, or when directed by your company commander.

e. Get a bath whenever possible. Watch for lice or other vermin on your body and clothing and, if found, report immediately to the medical officer.

f. Do not sit or lie directly on the damp ground. When you are hot or perspiring, or when your clothes are damp, do not remain where a draft can strike you. If you do, you will get chilled and as a result may contract a cold, rheumatism, or pneumonia.

g. Every day, if possible, hang your blankets and clothing out to air in the sun and shake or beat them with a stick. Wash your shirts, underwear, and socks frequently. Whenever possible, roll up your tent so the air and sun can get in it. Keep it ventilated at night.

h. Ditch your tent as soon as you can after it is put up, even if your camp is only for one night. If you do not, a little rain may spoil a whole night's rest.

i. Always prepare your bed before dark. If you have no cot, level off the ground and scrape out a little hollow for your hips. Use some straw, dry grass, leaves, or small branches. Sleep on your raincoat. This keeps the dampness from coming up from the ground and chilling your body.

194. The most important thing in your marching ability as a soldier is the care of your feet. You will find instructions on this matter in section II of chapter 10.

## ANATOMY AND PHYSIOLOGY

"Ye are fearfully and wonderfully made."—PSALMS 139-14.

**195. Introduction.** To intelligently perform his duties in the care of sick and injured, the medical soldier must have a practical knowledge of the structure of the human body. He must also know the functions of the various parts of the human mechanism because many procedures in the treatment of disease alter the normal function to meet a temporary need. The structure and the function of an organ are so closely related that it is well to study their relationship within one chapter. The information contained in this chapter is in no means complete; but it comprises those essentials necessary for the medical soldier's duties, and it will provide a background for further study in textbooks devoted entirely to anatomy and physiology.

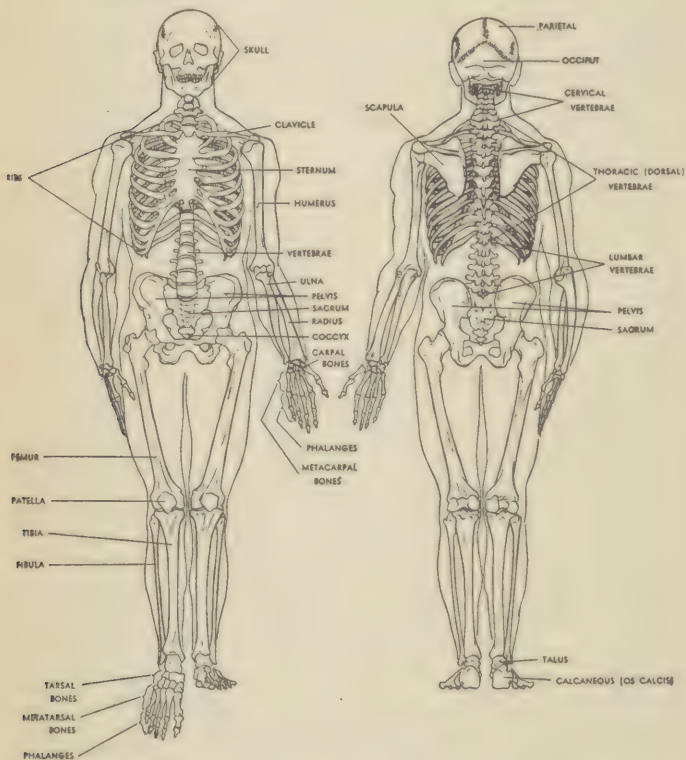
**196. Definition.** *Human anatomy* is the study of the structure of the body and the relation of its parts, one to another. The body consists of a bony framework to which softer tissues are attached. Each part is made up of a number of cells of various sizes and shapes. For example, bone is made up of bone cells, muscle of muscle cells, a nerve of nerve cells, fat of fat cells, and skin of skin cells. Anatomy, therefore, includes the study of the smallest cells to the complete body which these cells form.

*Physiology* is the study of the activities and functions of the various structures and organs of the living body. It includes the study of the activities of the smallest cells to the complete, human body. For example, muscle cells are long and have the power to contract; bone cells form the hardest and most enduring tissue in the body; nerve cells have long processes or fibres which carry impulses from one part of the body to another; fat cells store heat and energy; and cells of the skin protect the softer tissues underneath them.

**197. Development of the Human Body.** The human body develops from the union of a single female cell with a male cell. This union normally takes place within the womb of the female. The female cell is called the *ovum*; the male cell, a *spermatozoon*. After this union, which is known as *fertilization*, the female cell continues to divide and subdivide as it grows. The cells finally arrange themselves into three layers: the outer layer, the middle layer, and the inner layer. These three layers of cells, later in the act of development, assume different sizes and shapes, forming the various kinds of cells found in the body. For example, cells of the outer layer become the skin and nerve cells; cells of the middle layer, the muscle cells; and the cells of the inner layer, the cells lining the intestine. Combinations of one or more of the layers form the various body structures and organs. The tissues formed possess the characteristics of the cells which compose it. It is a wonderful feat of nature which, upon completion within the womb of the female, becomes a living being. At birth this new individual is separated from the mother, birth being that stage in which the newly-formed body is capable of independent body functions.

**198. The Skeleton.** The bony structure of the body is known as the skeleton. It is the framework of the body and may be compared to the chassis of an automobile, to which many parts are added to make a complete, operating machine. The skeleton consists of 206 different bones. The four main functions of bone are:

To support the body. All other tissues are attached to or supported by it.



① Front view.

② Back view.

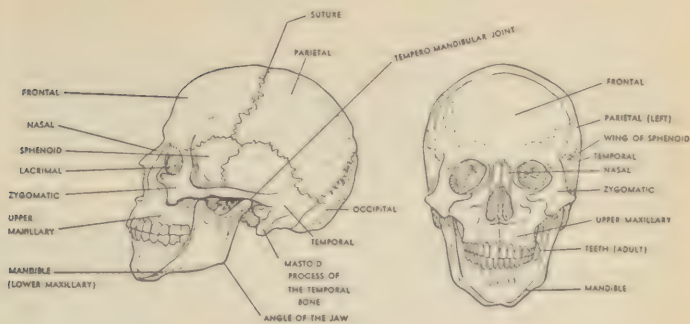
**Figure 59. The Skeleton.**

To afford protection to certain organs and structures which might easily be injured.

To furnish a system of levers which when acted upon by the muscles causes the body to move.

To give shape to the entire body.

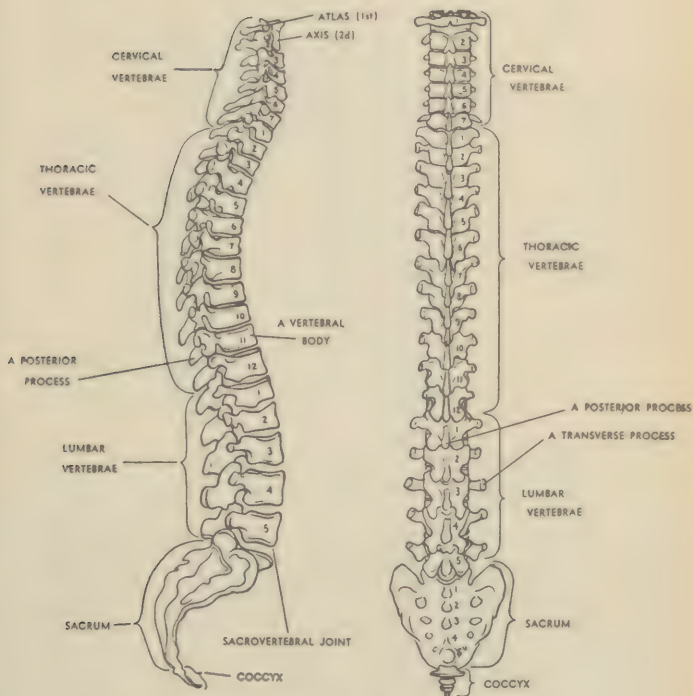
*The skull.* The skull includes the bones of the head. The cranium is that portion of the skull which encloses and protects the brain. It contains 8 bones. There are 14 bones in



① Side view.

② Front view.

Figure 60. The Skull.



① Side view (normal curvature). ② Back view (dorsal).

Figure 61. The Spinal (Vertebral) Column.

that portion of the skull forming the face. In addition the normal adult has 32 teeth.

*The spine.* The spine or vertebral column consists of 26 irregularly-shaped bones. Each vertebra has a flattened body at the back of which is an arch that encloses and protects the spinal cord. The vertebral column may be divided into five segments, the vertebrae being somewhat different in structure for each segment. They are as follows: cervical, thoracic, lumbar, sacral, and coccygeal.

*The chest wall.* The chest wall consists of the sternum (breastbone), 12 ribs on either side, and the vertebral column at the back. The upper 7 pairs of true ribs are joined by means of cartilage to the breastbone. The next lowermost 3 pairs of ribs have their cartilages attached to the rib above. The remaining 2 pairs have no attachment in front. The lowermost 5 pairs of ribs are known as the false ribs. The ribs protect vital tissues and organs in the chest. The chest and its contents are known as the thorax.

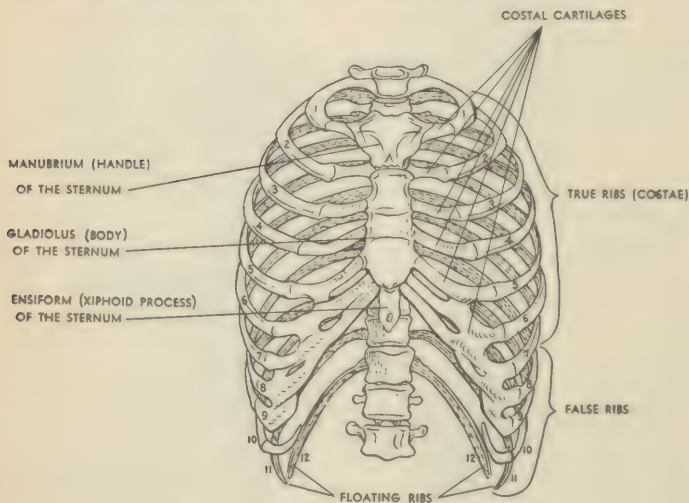


Figure 62. The Thorax (Front View).

*The shoulder bones.* The shoulder bones are the scapula or shoulder blade, and the clavicle or collar bone. The scapula lies within muscles which are outside the rib cage. In the upper and outermost portion of the scapula is the socket for the shoulder joint. The collar bone serves to keep the shoulder blade in place and protects the large blood vessels and nerves beneath it.

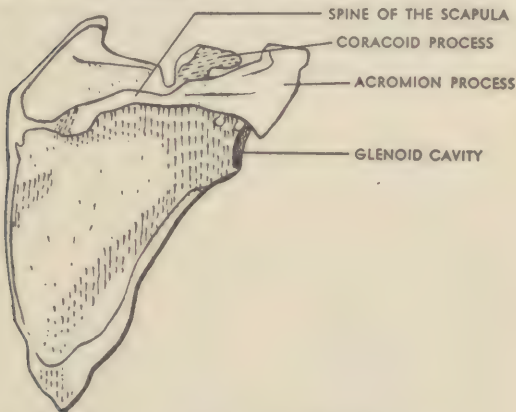
*The pelvic bones.* The pelvic girdle consists of the hip bone, on either side, and the wedge-shaped base of the spinal column, known as the sacrum, which is at the back. Each hip bone possesses a deep, round socket into which the head of

the thigh bone (femur) fits and rotates. The hip bone is composed of three separate bones—the ilium, the ischium, and the pubic bone. The pelvic bones furnish protection to the vital organs and structures within the pelvis.

*Bones of the extremities.* In anatomy the arms or upper limbs are classified as the upper extremities, and the legs or lower limbs are classified as the lower extremities. They are discussed together for the purpose of comparison; each contains



① The left clavicle or collar bone (upper surface).



② The right scapular or shoulder blade.

Figure 63. The Clavicle and the Scapula.

30 bones, and the arrangement in each is similar. The differences in structure are due to the principal functions required of each—the upper limbs for holding, grasping, and manipulating movements; the lower limbs for locomotion and weight bearing. For that reason the bones of the lower extremities are larger and heavier.

The *upper extremities* must have more freedom of action in order to give flexibility. The round head of the arm bone (humerus) is shallow and fits into the socket of the scapula (shoulder blade). This arrangement, together with the looseness of the attachment of the muscles of the shoulder, permits a wide range of movement at the shoulder. The *flexion* (bending) and *extension* (straightening) of the forearm is permitted by the hinge joint at the lower end (elbow) of the humerus.

The rotation of the forearm (*pronation* and *supination*) is possible because there are two bones in the forearm; only the ulna takes part in the hinge joint at the elbow and only the radius at the wrist. Therefore the relationship of the *radius* and *ulna* (bones of the forearm) may change at the wrist joint upon turning the hand. There are 8 small bones (carpal bones) in the wrist. They are loosely connected by ligaments which give them considerable freedom of movement. Distal (farther away from the body) to the

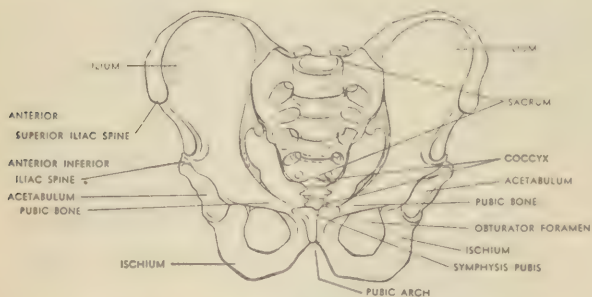
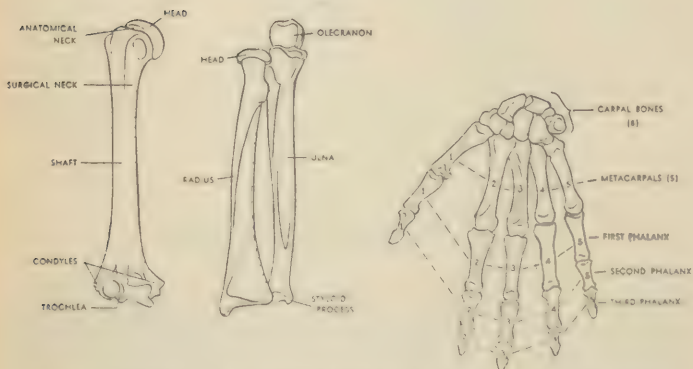


Figure 64. The Male Pelvis (Front View).



- ① The humerus (right).      ② Bones of the forearm (right).      ③ Bones of the right hand.

Figure 65. Bones of the Upper Extremity (Right).

wrist bones are the five *metacarpals* or bones of the hand. Each metacarpal is joined to a finger bone (*phalanx*) by a hinge joint. Collectively the bones of the fingers (and the toes) are called the *phalanges*. The thumb is so situated that it may be pressed against any portion of the other fingers. This permits the hand to grasp and manipulate objects readily.

The *lower extremities* do not require as much flexibility as the upper limbs. The hip muscles, unlike the muscles of the shoulder, are more firmly fixed; the socket of the hip bone into which the thigh bone (femur) fits is much deeper than the socket of the scapula. Consequently, while there is less flexibility at the hip joint, there is also less chance of dislocation. In the knee there is little forward motion. Because the fibula (outer leg bone), the more slender of the two leg bones, is attached firmly to the upper end of the tibia (inner leg bone), rotation is lacking in the leg. The bones of the ankle and the foot correspond to the bones of the wrist and the hand. They are, however, closely bound together by ligaments and do not possess a similar degree of freedom of motion. In order that there be elasticity to permit springiness in the step to avoid jarring, the bones of the foot are arranged in arch formation. This explains what is meant by "fallen arches" or flat feet, which often make walking very painful. The bones of the toes (*phalanges*) are much shorter than those of the fingers. They are less flexible, and the great toe as compared to the thumb cannot oppose any of the other digits (toes). Therefore the foot lacks the power to hold and grasp.

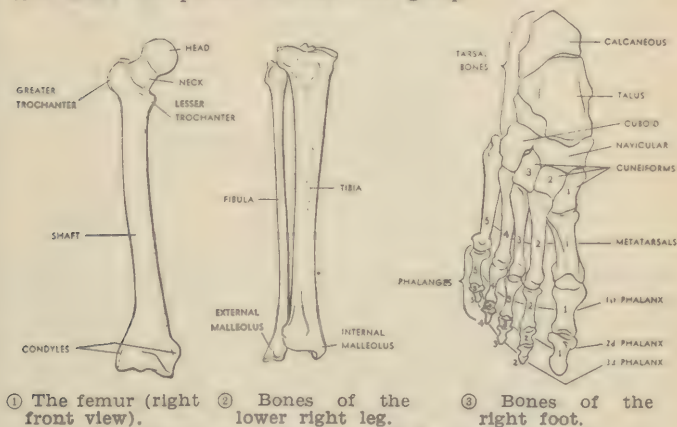


Figure 66. Bones of the Lower Extremity (Right).

**199. Development of Bone.** When a child is born the bones of the body, although formed, are not continuous masses of bony tissue. Each is partly composed of cartilage, a substance more flexible and not as hard as bone. The process of bone formation is complicated and begins in these areas of cartilage from small points or centers of ossification (bone formation). These centers finally enlarge and continue to enlarge until adult life is reached, when all of the cartilaginous tissue has been replaced by bone. The mineral content of the bone is increased and the animal matter is decreased as the individual grows older, the bone becoming more brittle and more apt to break (fracture).

The thin tissue, a sheet-like membrane which covers the bone, is called the *periosteum*. This is an important membrane because it is necessary for bone growth and nutrition. The bone surgeon will always take care to preserve the periosteum when bone repair requires surgery. The blood vessels are imbedded in this membrane and through it pass to the holes (nutrient foramen) in the hard part of the bone through which they enter into the hollow portion (medullary cavity). This cavity or canal contains the bone marrow.

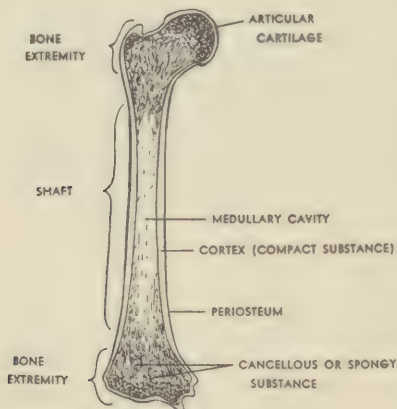


Figure 67. Longitudinal Section of a Long Bone.

**200. Joints.** Where two bones of the skeleton come together (apposition) they form a joint or articulation. Some joints permit no motion while others permit motion in many directions. The bones are held together by ligaments, and the joining surfaces of each bone are covered by a smooth, thick, tough cartilage that is lubricated by a secretion (synovial fluid) produced by cells lining the inside of the joint space. The principal kinds of joints are classified as follows:

**Fixed joints.** Fixed joints are those which permit no motion of the involved bones. They are also called *sutures* and may best be illustrated by the union between the bones of the skull.

**Ball-and-socket joints.** In a ball-and-socket joint the rounded end of one bone fits into the hollowed surface of another. Its characteristic is that a greater degree of motion is permitted than in other joints. The hip joint and the shoulder joint are examples. Each of these joints permits the limb to be moved in practically every direction.

**Hinge joints.** Hinge joints permit movement in one plane and may be compared to the hinge on a door. The knee joint is one of the best examples of this type of joint. The leg may be moved backward (flexed) onto the back of the

thigh, but it cannot be moved forward or to either side. When the leg moves sideward it is due to the freedom permitted by the hip joint.

**Pivot joints.** In a pivot joint one bone rotates around another which remains stationary. The best example of this type of joint is between the first and second vertebrae of the spine. Because of this arrangement the head may be rotated from one side to the other.

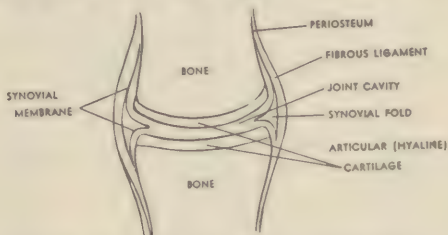


Figure 68. A Movable Joint (Schematic).

**Gliding joints.** In a gliding joint, little motion is permitted except that provided by one of the bones sliding a short distance over the surface of the other. Examples of this type of joint are those between the bones of the wrist.

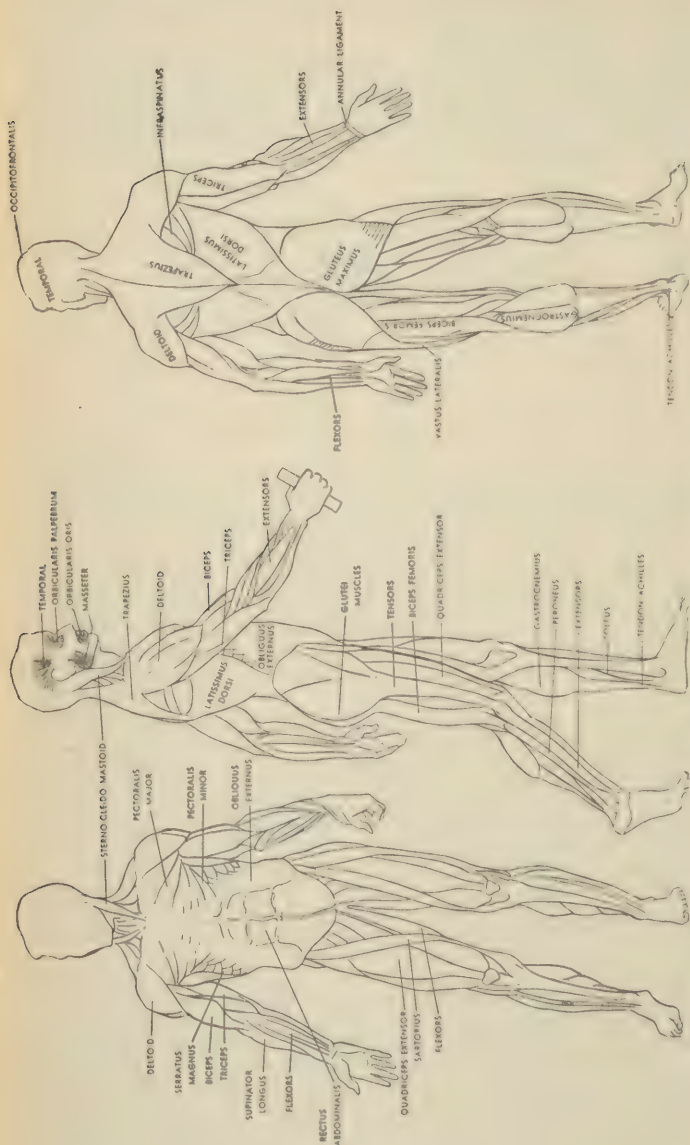
**201. The Muscles.** The muscles perform one of the important functions of the body, which is motion; the ability to move from one place to another; the movements of breathing; the beating of the heart; the activities of the stomach and intestines; and many other actions. These actions are accomplished by forcible contraction of muscle tissue. It must be remembered that muscular activity is dependent upon the skeleton, the nervous, the circulatory, and digestive system in order to maintain and control this action.

The appearance of human muscular tissue is roughly comparable to the lean butcher's meat and comprises about 50 per cent of the body weight. Muscle cells are of three distinct kinds, and therefore we have three types of muscular tissue: striped, smooth, and cardiac.

**Voluntary muscles.** Voluntary muscles are those muscles which are under our control and may be moved at will. They make up the mass of skeletal muscles and because of their striped appearance under the microscope are sometimes called *striped* or *striated* muscle.

**Involuntary muscles.** Involuntary muscles are not under our control and may not be moved at will. They are not fixed to the skeleton but largely surround cavities or tubes within the body. They appear smooth under the microscope. In comparison to the voluntary striated muscle, they are called the *nonstriated muscle*. The muscles of the stomach and the intestines are good examples of involuntary muscle.

**Cardiac (heart) muscle.** Heart muscle is involuntary muscle but differs somewhat from other involuntary muscle tissue when examined under the microscope. It more closely resembles the striated muscle.



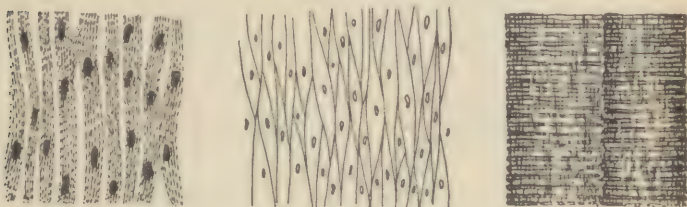
① Front view.

② Side view.

③ Back view.

Figure 69. Muscles of the Human Body.

*Muscular movements.* Muscles are attached by means of tendons or heavy fibers to the bones of the body. By their contraction, parts of the body are forced to move. The point where one portion of the muscle is attached to the bone is called the *origin of the muscle*; where the opposite end of the muscle is attached is called the *insertion*. The origin is usually in that part of the skeleton which is less freely movable than the part to which the insertion is attached. It must be remembered that muscles are of various sizes and shapes and may have attachment to the bone only at one end or along one side, depending on the function of the muscle, the other end being attached to another muscle or structure of the body.



① Voluntary muscle (striated).    ② Involuntary muscle (nonstriated).    ③ Cardiac muscle.

Figure 70. Muscular Tissue.

When skeletal muscles serve to move bones they act as levers. When we send a nervous impulse to a voluntary muscle, that muscle moves either rapidly or slowly as we will it to. For example, the biceps (large muscle in the front part of the arm) contracts, and the forearm is flexed at the elbow. When the triceps (large muscle in the back part of the arm) contracts, the arm is extended. The nervous system coordinates this action so one muscle will relax while the other contracts; otherwise the action of one would oppose the action of the other.

However, involuntary muscle acts without any direction sent to it by our will and may contract at varying intervals. The muscles of the stomach and intestine will contract continuously while there is food within the alimentary tract.

*Muscles and posture.* Correct posture is the term applied to that position of the body in which there is the least possible strain or friction, no matter what the amount of physical labor. It is a position of equilibrium of the body, such as standing, sitting, or lying, which can be maintained for some time. The term, "the position of the soldier," used in the Army, is the normal standing position of the well-developed and healthy individual. When the body is held in a certain posture, there is always a slight, sustained contraction of the muscles to prevent the joints from bending. If the position is held for any considerable length of time a certain amount of fatigue is produced. Should the muscles not be in a healthy condition this fatigue is produced earlier. The

result of this fatigue causes the muscles to relax, and the posture becomes improper. When a person, not well developed, stands at attention (erect) for a long period the muscular relaxation causes him to slump.

*Exercise of muscles.* Good food, pure air, and a proper functioning of the body activities are necessary for the healthy operation of the body. In addition to these, the muscles must be exercised in order to get the proper nourishment. Each muscle acts as sort of a chemical engine. Contraction and relaxation are required frequently in order to throw off waste products and take in new fuel from the surrounding body fluids (blood and lymph).

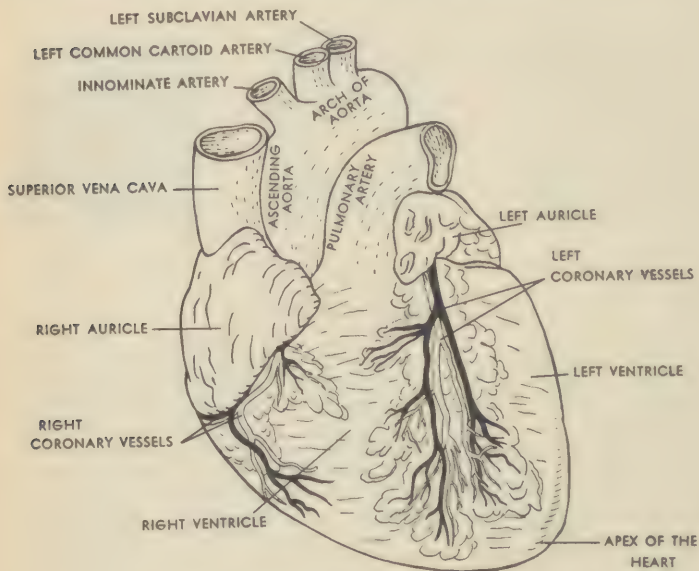


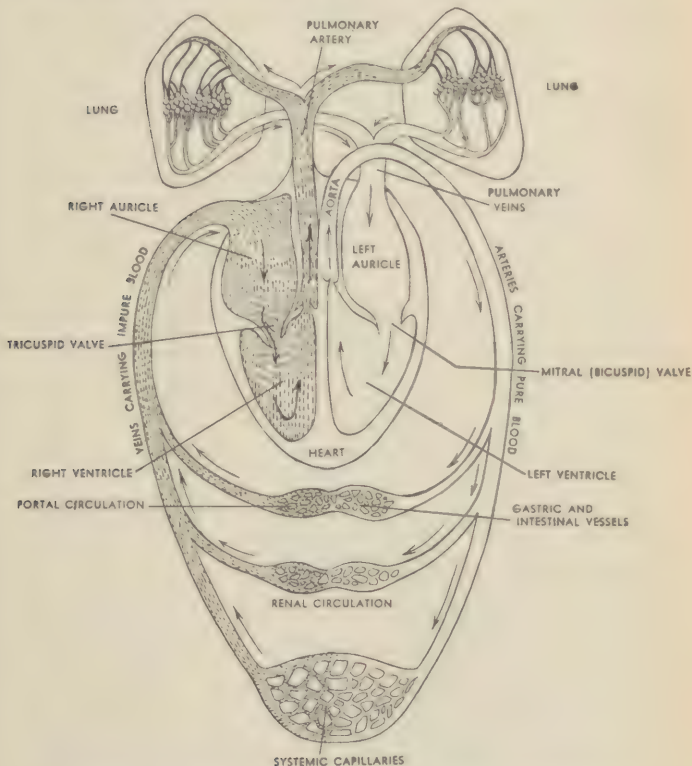
Figure 71. The Heart.

When a muscle is not used at all it becomes much smaller and wastes away. This is called *atrophy* of the muscle. When any muscle or group of muscles are used in excess of normal the muscles become larger or undergo what is known as *hypertrophy*. The calf muscles of the legs of track men are examples of hypertrophy. The muscle cells become larger but do not increase in number.

*Tendons.* Tendons are white, glistening cords made up of closely packed, parallel bundles of nonelastic, dense fibrous tissue. Their great strength and lack of bulk make their presence about the joints desirable because joint movements may be accomplished more easily. They serve as attachments of the muscle to the bony structure of the body. When a

tendon serves as a strong connecting fiber between muscles it is called an *aponeurosis*.

**202. The Circulatory System.** The heart and the blood vessels form the *cardio-vascular system*. This system consists of a series of closed tubes of various sizes through which the blood circulates. Circulation of the blood is maintained by the forced contractions of a muscular pump, the heart. The heart and this system of vessels bring blood to and from the tissues in all parts of the body.



**Figure 72. The Circulation of the Blood (Schematic).**

**The heart.** The heart is a large, hollow, cone-shaped muscular organ about the size of the fist. It is enclosed in a tough, fibrous sac, known as the *pericardium* (meaning around the heart), and is located between the lungs near the front part of the chest. The larger portion of the heart is on the left side of the mid-line. It is protected by the rib cage.

Because of its function, the heart is divided vertically into two separate halves without any direct opening between them so that each side of the heart operates independently. Each half has two cavities, an *auricle* above and a *ventricle* below. The auricles are smaller and have thinner walls.

The right side of the heart is called the venous side as it receives into its auricle the impure blood collected by the veins. From the right auricle the blood passes down to the right ventricle, then via the pulmonary artery to the lungs where it is purified. When purified (oxygenated) it is returned via the pulmonary vein to the left auricle of the heart. The blood now passes down to the left ventricle, which contracts forcefully and pushes the blood out through the systemic arteries to the various parts of the body.

There are two circulatory systems connected with the heart. The circulation of the blood from the right ventricle of the heart to and through the lungs and back to the left auricle of the heart is the *pulmonary circulation*. The circulation going from the left ventricle of the heart through the body, exclusive of the lungs, and back to the right auricle of the heart is the *systemic circulation*.

The circulation of that portion of the blood within the systemic circulation which goes to the stomach, spleen, and intestines, and on its return to the right auricle of the heart goes through the portal vein and capillaries of the liver and is known as the *portal circulation*. That portion going to the kidneys is known as the *renal circulation*. It is important in that it brings food material from the digestive system to the liver to be acted upon by that organ and either placed in the circulation or stored for future use.

**Blood vessels.** The tubes which carry the blood away from the heart are called *arteries*; those which carry the blood to the heart are called *veins*. Connecting the arteries and veins in the different tissues are small, hair-like vessels known as *capillaries*. Except within the pulmonary circulation, the arteries contain purified blood and the veins the blood containing waste products. Because of the thin walls and dense network of the capillaries the blood within them comes into close relationship with the tissues of the body. The blood gives up food and oxygen to the tissues and takes away their waste products, which are carried to a point where they can be excreted by the kidneys and lungs.

**Blood.** The total quantity of blood for the average adult is estimated to be one-twelfth of his body weight. The average man may be considered to have 1½ gallons of blood.

The color of the blood when purified by its oxygen content is bright red. Therefore it is bright red in the arteries. In the absence of oxygen, it is dark red and is so found in the veins. It is composed of blood cells (corpuscles) transported in a liquid known as the *plasma*.

**Plasma** is composed of *fibrin* and a true liquid called *serum*. The fibrin is the substance which causes the blood to clot or coagulate when bleeding occurs. The serum, which is the plasma without the fibrin, contains the nutritive (food) elements of the blood.

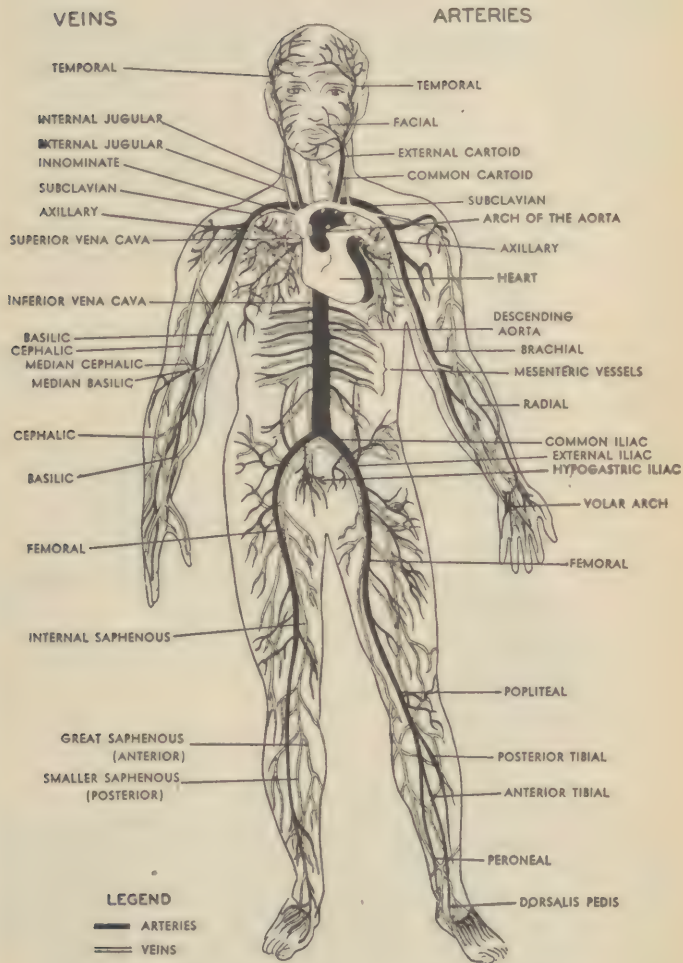


Figure 73. Principal Arteries and Veins of the Body.

The *blood cells* or *corpuscles* are of three types: the red cells or *erythrocytes*, the white cells or *leucocytes*, and the *blood platelets*.

The red cells are flattened discs, slightly concave (indented) on each side, and contain hemoglobin. *Hemoglobin* is a substance containing iron, which has the ability to carry large amounts of oxygen. There are five million red corpuscles per cubic millimeter of blood in the healthy male.

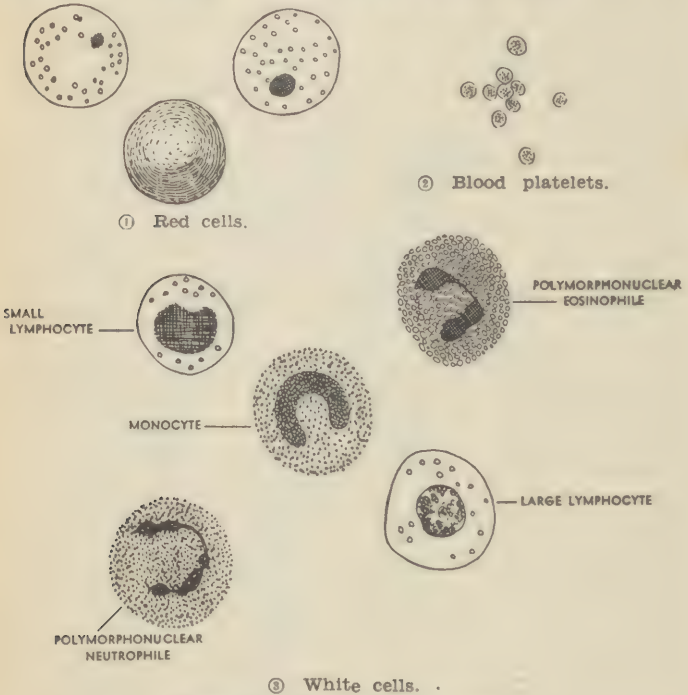


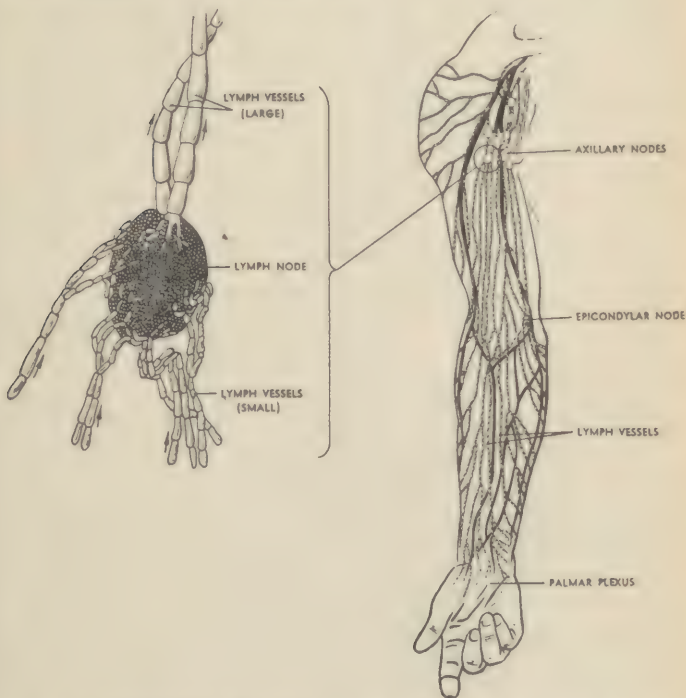
Figure 74. Types of Blood Cells.

The white cells are spherical and slightly larger than the red cells. In the healthy human adult there are between 5000 to 7000 white cells per cubic millimeter of blood. These cells are able to change their form and pass through the walls of the blood vessels and destroy disease-producing organisms. They form the first line of defense against infection and poisons. Consequently, in most infectious diseases the number of these cells greatly increase.

The blood platelets are small, almost colorless cells. Their average number is approximately 300,000 per cubic millimeter of blood. It is believed that the function of the platelets is to assist in the clotting of blood and to maintain immunity against certain diseases.

The study of blood is known as *hematology*.

**203. The Lymphatic System.** The lymphatic system is similar to the blood circulatory system except that the lymph fluid is clear and the lymph circulates between the cells of the body and the capillaries of the blood circulatory system. The lymph fluid is similar in composition to the blood plasma. The lymph vessels begin in the small spaces between the individual cells of the body tissues; they unite to form larger vessels and empty into the venous blood system by way of a large lymph vessel, the *thoracic duct*. The thoracic duct is located in front of the bodies of the vertebrae, beginning in front of the second lumbar vertebra, and extends upward, gradually inclining to the left until on the level with the seventh cervical vertebra where it empties into the innominate vein beneath the left collar bone.

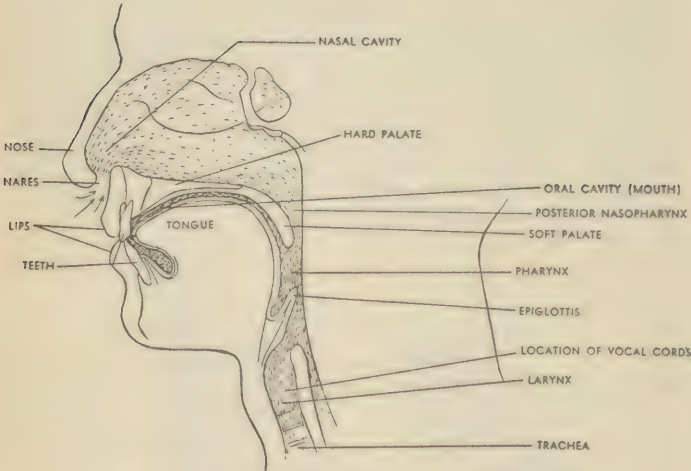


① A lymph gland, showing incoming and outgoing vessels.

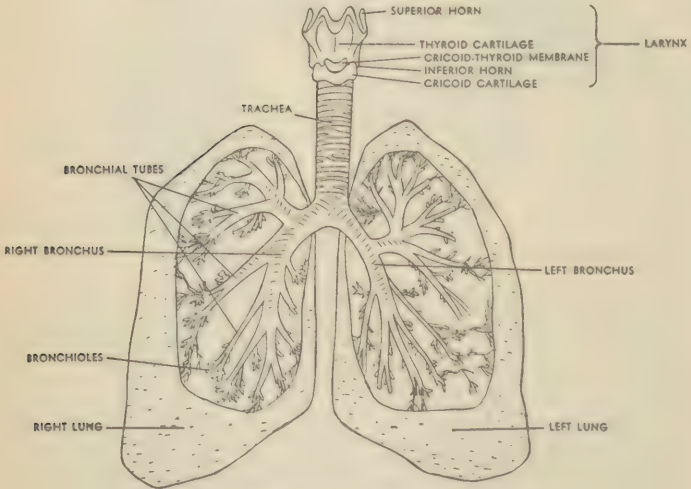
② Lymphatic network of the right arm.

Figure 75. Lymphatic System of the Upper Right Extremity.

The lymphatic system includes lymph nodes, which are bean-shaped glandular bodies along the course of the larger lymph vessels. The lymph passes through the substance of the node, thereby being filtered and purified. In case of in-



① Upper respiratory tract.



② The larynx, trachea, bronchi, and lungs.  
Figure 76. The Respiratory System.

fection these nodes become inflamed and enlarged. They are of importance because they aid in localizing and controlling infections, so the blood stream does not become infected.

**204. The Respiratory System.** The respiratory system consists of the structures and organs involved in the act of respiration. The term respiration means the function of gaseous interchange between the air taken into the lungs and the blood.

Air reaches the lungs through the air passages: the *nose*, *pharynx*, *larynx* (voice box), and *trachea* (windpipe). It enters from outside the body through the nose under ordinary conditions, although it may be taken in through the mouth. The nose is divided into two nasal passages by a partition called the *septum*. The inside of the nose is so shaped that the cooler, outside air is slightly warmed and certain foreign materials, such as dust particles, are removed before the air reaches the lungs. Near the nasal passages are irregularly-shaped cavities called the *sinuses*. Their inner surfaces are lined by a moist membrane similar to that found within the nose. Inflammation of this membrane is called *sinusitis* and may arise from an extension of an ordinary cold in the nose. Secretions of the sinuses drain into the nasal cavity.

*The pharynx.* The pharynx is the large passageway back of the mouth. It is a common channel for food and air, since both the mouth and nasal cavity open into it. The pharynx extends downward to the opening of the larynx in front and to the opening of the gullet, or esophagus, in the rear. At the base of the tongue there is a small triangular-shaped flap covering the opening into the larynx; it prevents food from entering the larynx because when food is swallowed this flap, called the *epiglottis*, closes.

*The larynx.* The voice box, or larynx, connects the pharynx and the trachea (windpipe). It is composed of circular cartilages, muscular tissue, and connective tissues and contains the vocal cords. When the vocal cords are in a certain position and air is driven past them, their vibration makes a certain sound. The size of the opening made by the vocal cords controls the pitch of the sound, and the force of the air through the opening determines the loudness. The resonance of the sound and other alterations necessary to produce the desired sound are also dependent upon the pharynx, the mouth, sinuses, nasal cavity, and the movements of the tongue, cheeks, throat, and lips.

*The trachea.* The windpipe, or trachea, is a tube of circular rings of cartilages extending from the lower part of the larynx to the lungs. About four inches below the larynx it divides into two tubes, the bronchi, one of which goes to each lung.

*The lungs.* There are two lungs, the right lung and the left lung. The bronchi continue into the lungs, their walls becoming thinner and thinner, dividing and redividing until they end in tiny air sacs. The thin wall formed by a single layer of cells in the air sacs, with the thin-walled capillaries surrounding them, permits the inhaled air to release oxygen to the blood and remove the carbon dioxide from it.

Covering the lungs is a thin membrane called the pleura. The arteries, veins, and bronchi enter at the roots of the lungs.

The *chest cavity* is a cone-shaped cavity with the narrow portion under the collar bone. It is surrounded by the ribs, breastbone, spinal column, and the diaphragm. The chest also contains the heart, trachea, and esophagus. It is lined on the inside by the same kind of membrane that covers the lung, the pleura, and is continuous with it. The space between is known as the *pleural cavity*.

*Respiration* is a voluntary movement to a certain extent, as one can breathe rapidly or slowly or take a deep or shallow breath. However, ordinary breathing goes on unconsciously. When impure blood reaches the lungs in increased quantities, there is a greater demand for more pure air. This condition stimulates, through the brain center, a need for increased speed and depth in breathing. This action takes place involuntarily.

When one inhales, the chest increases in size, the ribs are pulled outward, and the diaphragm contracts and flattens, pulling in the air by increasing the length of the chest cavity. This is known as *inspiration*. *Expiration* requires little muscle action as the diaphragm and intercostal muscles relax, permitting the chest to return to a resting position.

The lung capacity varies in different individuals, but in an average man, even after forced expiration, the lungs contain about 1000 cubic centimeters of air. This air is known as residual air. Under normal conditions we do not make forced expirations, and there are usually about 3000 cubic centimeters of air remaining in the lungs after expiration. Deep breathing is of value in that it opens all the air sacs and permits a complete ventilation of all the air passages. Correct posture facilitates good breathing.

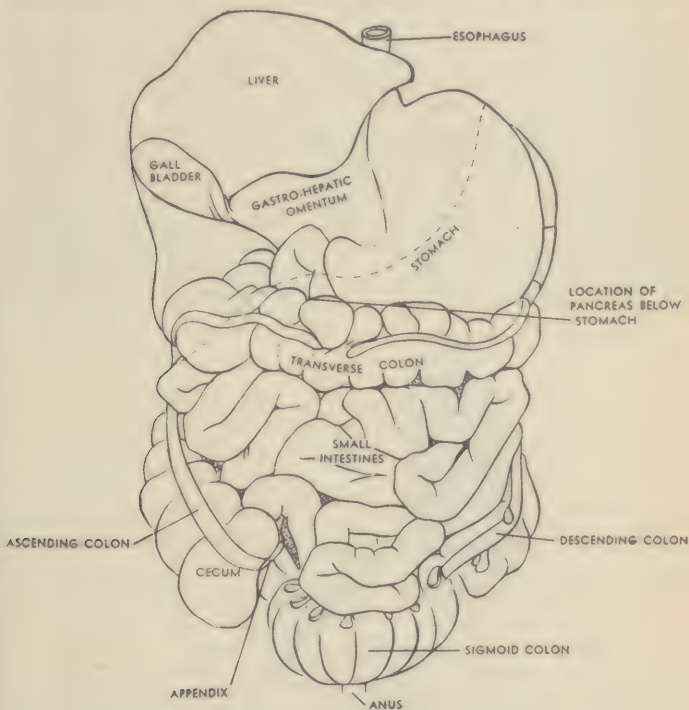
**205. The Digestive System.** The digestive system is made up of the food passageway (alimentary canal) and the various organs and glands attached to it. The function of the digestive system is to so prepare the food eaten that it can be absorbed and used by the various tissues of the living body.

In addition to the various food substances—carbohydrates, fats, proteins, minerals, and vitamins—the body requires water, since a large portion of the body is composed of water.

In order that the above food elements may be used by the body, certain substances, called enzymes, present in the secretions of the alimentary canal, reduce these foods into simple solutions so they can be absorbed and transported to the various tissues where they are needed. Some of the alimentary secretions contain more than one enzyme. There are certain enzymes for the different types of food. For instance, some split carbohydrates into simple sugars; others, fats into fatty acid and glycerine; and still others, proteins into acids.

After the food has been reduced by these digestive juices, it is absorbed by the blood, or lymph, circulating in the walls of the alimentary canal. Most of the absorption takes place in the small intestines. Food absorbed by the lymph vessels surrounding the alimentary canal is collected into, and later

discharged from, the thoracic duct (a large lymph vessel) into the blood stream. The blood gives up the food substances to the various tissue cells through the lymph, nearby the capillaries. The lymph, in turn, passes the food on to the tissue cells by the same process. This entire procedure is called assimilation and is brought about by means of an interchange



NOTE—The Liver and Gall Bladder have been lifted up. See dotted line for normal position in front of stomach and transverse colon.

Figure 77. The Digestive System.

of fluids governed by osmotic pressure. *Osmotic pressure* is the passing of the more dense fluid to the less dense, and vice versa, through a thin membrane. The complete process, including the oxygen and food intake and the means by which they are utilized by the living tissue, is known as metabolism.

*The mouth.* The mouth is the first organ taking in the digestion of food for absorption. After food is taken into the mouth, it is chewed by the teeth and mixed with a substance called saliva. Glands in the cheeks, under the tongue, and in the lower jaw secrete saliva through small ducts opening

into the mouth. Saliva contains an enzyme known as *ptyalin*, which acts on starches and reduces them to a sugar called maltose. If one chews a soda cracker for a prolonged period before swallowing, he will notice that it has a sweet taste. After the food becomes semi-liquid, it is swallowed and passes down the esophagus to the stomach.

*The stomach.* The stomach is a hollow, sac-like, muscular organ which lies just below the diaphragm and is lined on the inside with cells that secrete the gastric juice. This acid liquid contains pepsin, an enzyme that breaks certain proteins up into simpler compounds. At the entrance to and the outlet from the stomach there are rings of muscular tissue which keep the food in the stomach until the proper digestion has been completed. Then the muscle fibers contract and force the food into the small intestine.

*The small intestine.* The small intestine is a tube about 22 feet long which lies in coils within the abdominal cavity. In it digestion begun in the mouth and stomach is completed, and the majority of the food is absorbed by the blood and lymph through the walls of the intestinal villi.

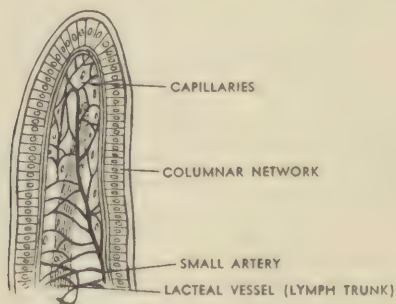


Figure 78. An Intestinal Villus.

There are small openings into the intestine through which secretions of the pancreas and liver are received. The pancreas, which is a long, narrow gland located back of and below the stomach, secretes pancreatic juice. This juice reduces further the proteins and starches, a process already started in the stomach, and, in addition, acts upon the fats.

*The liver.* The liver secretes bile which aids the pancreatic juice in its action upon fats. The liver is the largest gland in the body and is situated on the right side of the abdomen, just beneath the diaphragm. The bile is formed by the liver cells and is collected in small ducts which unite to form the hepatic duct. Some of the excess bile passes up to the gall bladder, which is a bile reservoir, where it is stored for future use as required. When the gall bladder contracts, the stored bile is forced through the cystic duct. The cystic duct joins the hepatic duct to form the common bile duct which empties into the small intestine.

Cells of the small intestine also secrete an intestinal juice which completes the breaking down of the proteins and starches. Undigested food and other waste products pass on to the large intestine.

*The large intestine.* The large intestine, or colon, is three to four feet long and is much larger in diameter than the small intestine. It begins in the lower, right part of the abdomen where the small intestine empties into it through the ileocecal junction. From there it extends upward (ascending colon) to the under surface of the liver, then across the upper abdomen (transverse colon) to the spleen, and thence down the left side (descending colon) to the anus. Most of the food substances are absorbed in the small intestine. The contents discharged into the large intestine are liquid. Whatever remains of food value and the majority of the liquid contents are absorbed in the colon. The remaining material then consists of undigested substances, waste products, and unabsorbed fluids, all of which are passed as fecal material. The sigmoid and the rectum are the lower portions of the large intestine. This portion of the bowel permits retention of the feces so that defecation is voluntary.

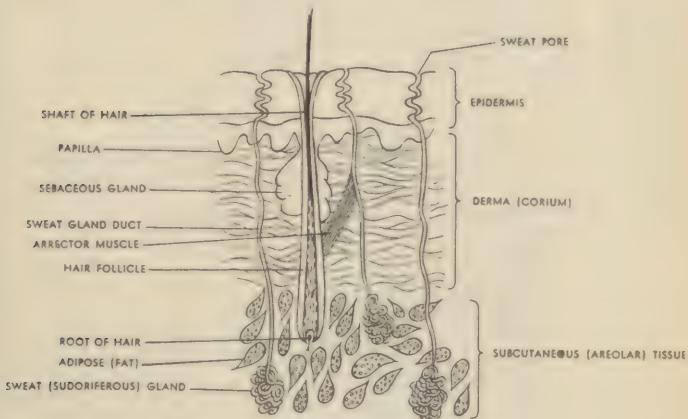
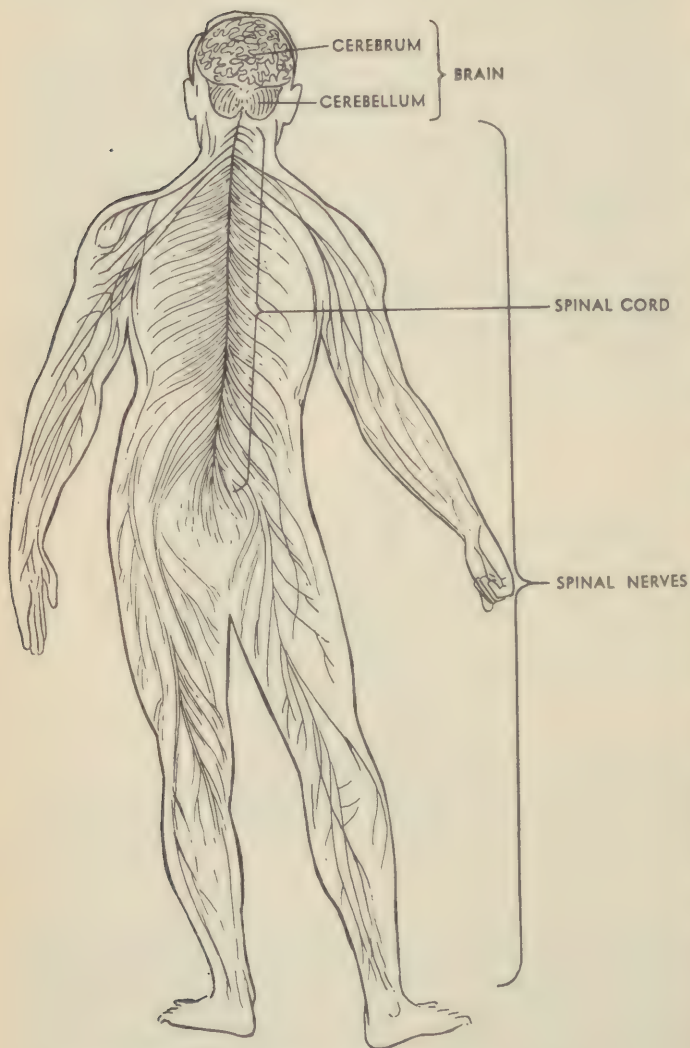


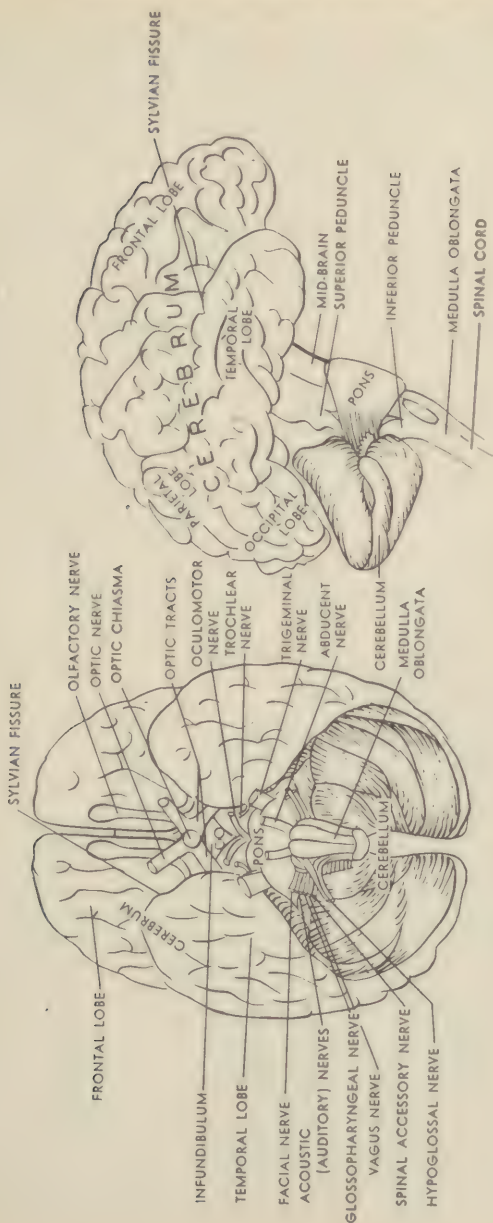
Figure 79. A Section of the Skin.

**206. The Excretory System.** Waste products of the body are disposed of by means of the skin, lungs, urinary system, and the large intestine. The liver also acts as an accessory excretory organ because it separates waste material from the portal circulation, makes certain harmful (toxic) excretory substances harmless, and returns them to the blood for excretion through the skin and the kidneys.

The skin has other functions in addition to providing a protective covering for the subcutaneous tissues. The skin consists of two layers, the cuticle, or epidermis, and the true



**Figure 80. The Brain, Spinal Cord, and Spinal Nerves.**



① Under surface.

Figure 81. The Brain.

② Side view.

skin. Located in the true skin are numerous, tiny sweat glands. They secrete sweat, the quantity of which varies, depending on the temperature and the activity and physical condition of the individual. By this action, the skin is a body heat-regulator. The perspiration contains waste products similar to those contained in the urine. In this manner, the skin has an excretory function.

The lungs, urinary system, and large intestine are discussed elsewhere in this chapter.

**207. The Nervous System.** The nervous system of the living body can be compared to the operation of a telephone system—the brain being the telephone center, the large nerves the trunk lines, and the small nerves the individual telephone lines. It is the most complex system of the body. Just like a big business concern, some of the problems may be taken care of by branch offices without complete knowledge of the home office, so there are various nerve centers which can take care of local needs without conscious participation of the highest center, which is the brain. Involuntary actions, such as heart action and movements of the stomach and intestines, are automatic and are made unconsciously. They are handled by the sympathetic nervous system. Voluntary actions are controlled by the cerebrospinal nervous system.

The sympathetic nervous system consists of two rows of central ganglia (mass of nerve cells) lying along the front of the vertebral column. These ganglia are united with each other by strands of nerve fibers and connected by means of sympathetic nerves to the various parts of the body.

The cerebrospinal system is made up of the brain and spinal cord and the nerves given off by these organs, namely, the cranial and the spinal nerves.

*The brain.* The brain, a complex mass of nervous tissue, lies within and well-protected by the skull. It consists of a large cerebrum, a much smaller cerebellum, the mid-brain, the medulla oblongata, and the pons. The average weight of the brain in the adult is about forty-eight ounces (three pounds).

*The cerebrum* is egg-shaped and fills the entire upper portion of the skull. It is the seat of intelligence, and, if removed, all power of voluntary action and all sensations of light, taste, smell, touch, and hearing are lost. Here decisions are made and messages are sent to the muscles, telling them what to do. Mental exercise keeps the cerebrum active and capable of development. Certain portions of the cerebrum have definite tasks, and for that reason it is divided into lobes as follows: the frontal lobes, the parietal lobes, the temporal lobes, the occipital lobes, and the insula (Island of Reil). These lobes are separated by fissures (crevices), and each has ridges called convolutions. The large fissure which almost separates the two halves, or hemispheres, and extends from the back to the front of the cerebrum is the *longitudinal cerebral fissure*. The two hemispheres are joined in the center by a broad, transverse band of nerve fibers called the *corpus callosum*. Separating the cerebrum and the cerebellum is a horizontal fissure called the *transverse fissure*.

Within each of the halves there is a longitudinal cavity containing cerebrospinal fluid known as a *lateral ventricle*. A third ventricle is situated behind and connects the two lateral ventricles. A fourth ventricle is in the upper portion of the spinal cord and connects the third ventricle with the central canal of the spinal cord. Openings between these cavities permit the cerebrospinal fluid to circulate from the ventricles to the central canal of the spinal cord. This fact is of considerable importance in the diagnosis and treatment of diseases of the nervous system.

The *cerebellum*, which is oval shaped and slightly constricted in the center, lies in the lower and back part of the cranium. It is below the posterior portion of the cerebrum, connected to the cerebrum by the superior peduncles, to the pons by the middle peduncles, and to the medulla oblongata (upper portion of the spinal cord) by the inferior peduncles. Peduncles are bundles of nerve fibers, comparable to the large trunk lines between power houses and substations. The cerebellum is the chief center of muscular coordination and sense of equilibrium. It causes all the muscles to keep the proper amount of contraction and causes them to relax and contract so they will not interfere with the action of other muscles in performing a desired movement. Lack of this coordination may indicate some lack of development, disease, or injury involving the cerebellum, or the pathways leading to and from it.

The *mid-brain* is a short, constricted portion connecting the pons and the cerebellum with the hemispheres of the cerebrum.

The *medulla oblongata* is continuous with the spinal cord, which, upon entering the cranial cavity through the *foramen magnum* (opening in the base of the skull), widens into a pyramidal-shaped form, the broad end of which joins with the pons. Within the medulla oblongata are the roots of many of the cranial nerves and nerve fibers which pass to the cerebellum, to the cerebrum, and to the sympathetic nervous system. Many nerve fibers also arrive there, relaying messages from all parts of the body. It is a large traffic control for incoming and outgoing messages. The medulla oblongata is also the seat of vital and reflex centers, regulating the action of the involuntary organs in compliance with the conditions made known through incoming messages (sensations) from the various listening posts (nerve endings). In this respect, its most important function is the control of the heart and respiration.

The *pons* (Varolii) is located between the mid-brain and the medulla oblongata in front of the cerebellum. It is a bridge between the two halves of the cerebellum and also a bridge between the medulla oblongata and the cerebrum. Several of the cranial nerves leave the brain for their destination from the pons.

The *spinal cord*. The spinal cord is a continuation of the nervous tissue of the brain which extends from the brain down through the spinal canal in the vertebral column. The upper portion where it is attached to the brain is widened

out to form the medulla oblongata. It is a large bundle of nerve fibers which carry nervous impulses to and from the various parts of the body—a large trunk line, carrying impulses in both directions.

*Meninges.* Covering and enclosing the brain and spinal cord are three membranes known as the meninges. They are designated from within outward: the pia mater, the arachnoid, and the dura mater. The *pia mater* is a delicate membrane containing blood and lymph vessels and is closely adherent to the entire surface of the spinal cord and brain. The *arachnoid* is also a delicate membrane between the pia mater and the dura mater. Between the pia mater and the arachnoid membrane is a space containing cerebrospinal fluid. The arachnoid does not adhere or dip down into the fissures (exception is in the longitudinal fissure) but surrounds the brain and spinal cord loosely. The *dura mater* is a dense, stronger membrane containing a great many blood vessels. It has two layers within the cranium, the outer forming the inner periosteum for the bones of the cranium; the inner and thinner layer continues down into the spinal canal and encloses the spinal cord.

The *cerebrospinal fluid*, found in the sub-arachnoid space and ventricles, acts as a nutritive fluid for nerve cells and as a buffer for protection of the delicate nerve tissue of the brain and spinal cord. It is a clear fluid, containing traces of proteins and other organic substances. Certain diseases may increase, decrease, or alter the cerebrospinal fluid in various ways. It is formed in the ventricles of the brain by tufts of blood vessels.

*Nerves* are a continuation of the nervous tissue fibers into the various parts of the body. Cranial nerves are those emanating from the cranial portion of the nervous system; spinal nerves are those from the spinal cord. Nerves have a sensory or motor function, the sensory (afferent) nerve fibers carrying the incoming messages and the motor (efferent) nerve fibers carrying the outgoing messages. Through this intricate system of nervous tissue, the living body is provided with a coordinated operation of all its organs and structures. The activity of one organ is often dependent upon the action of another. The necessary teamwork for normal body activities and maintenance of health is dependent upon this communication system and the result of the decisions and coordination from the brain.

*The senses.* The special senses are seeing, smelling, hearing, tasting, and feeling. Through them the activities of the body are, to a large degree, determined. These senses are made possible by the peculiar development and structure of the sensory nerve endings in various parts of the body.

The sensory nerves of *taste* are all located in the taste buds of the tongue. Those of *smell* are in the membrane within the nose. The sense of *sight* is made possible because of the retina of the eye, which interprets and makes images of the light waves. *Sound* sensations are transmitted to the brain by the organs of corti within the inner ear. The *sense of feeling* is more generally distributed over the body surface. In some places, as in the finger tips, the sensory nerve end-

ings are close together and the sense of feeling is more acute. The sensation of feeling may have any one or more of four qualities: pressure, cold, heat, and pain.

The *eye* is like a small camera which is constantly in operation, taking pictures and sending them to the brain. The eyes are located in the bony cavities (orbits), which are hollow sockets in the front part of and outside the skull. Their only exposed side is to the front, and this surface is protected by the eyelids, eyebrows, and eyelashes. The inner surface of the eyelids and the exposed surface of the eye are kept moist by the secretion of the tear (lachrymal) glands in the eyelids. At the inner and lower corner of each eye is the opening of the lachrymal duct which drains the tears from the eye to the nasal cavity.

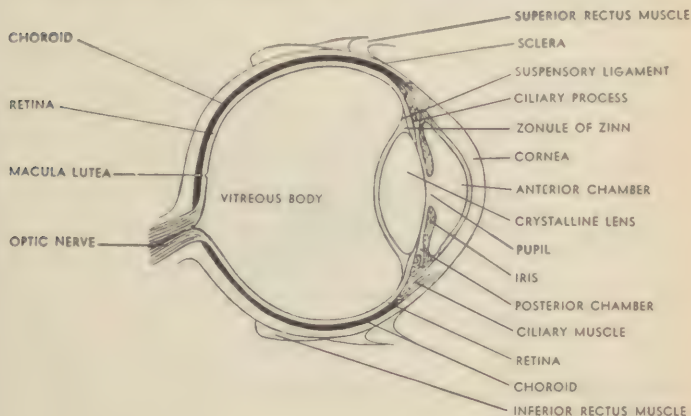


Figure 82. Diagrammatic Section of the Left Eye.

The eyeball is spherical in shape and is composed of two hollow segments, the anterior and the posterior. The anterior chamber comprises about one-sixth of the eyeball and contains a gelatinous material, the *aqueous humor*. The posterior segment contains *vitreous humor*. The eyeball has three coats (tunics). From without inward, they are: a thick protective membrane (the *sclera*), which is continuous with the clear *cornea* in front but otherwise white; a middle coat, which contains blood vessels, a small muscle (ciliary muscle) and, in front, the iris (which contains color cells and forms the pupil); and the inner coat, the *retina*, which contains the light-sensitive cells of the optic nerve.

The crystalline lens is placed directly behind the pupil and is held in place by the ciliary muscle (muscle of accommodation because it shortens or lengthens the lens)

In comparison with the camera, the rays of light enter the front of the eye through the pupil (shutter), pass through the lens, and are registered on the retina, which corresponds

to a color-sensitive film. The regulation of the light is controlled by the iris, which produces a small opening in bright light and a larger one in dull light. Adjustment for distance is made by means of the crystalline lens, which is automatically made thicker or thinner by the ciliary muscle so the light rays will fall properly upon the retina. The image falling upon the retina stimulates the light sensory cells therein, and the sensation is conveyed by the optic nerve to the brain where perception takes place.

In the normal eye, the optical center of the refractive system is 15.5 millimeters from the retina. However, in many individuals the distance is greater or less. If this is the case, the images on the retina are not distinct. Correction must be made by the use of glasses containing lenses which return the focus of light rays in a relation to the retina so as to make the image distinct.

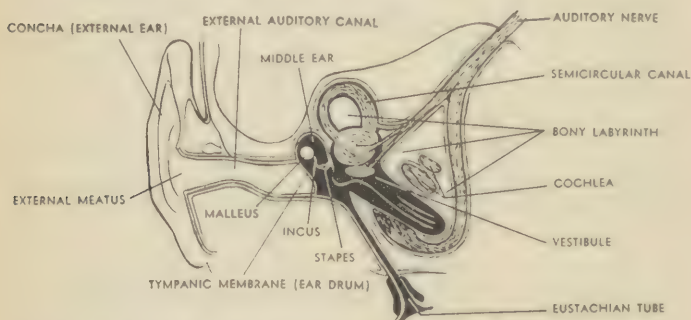


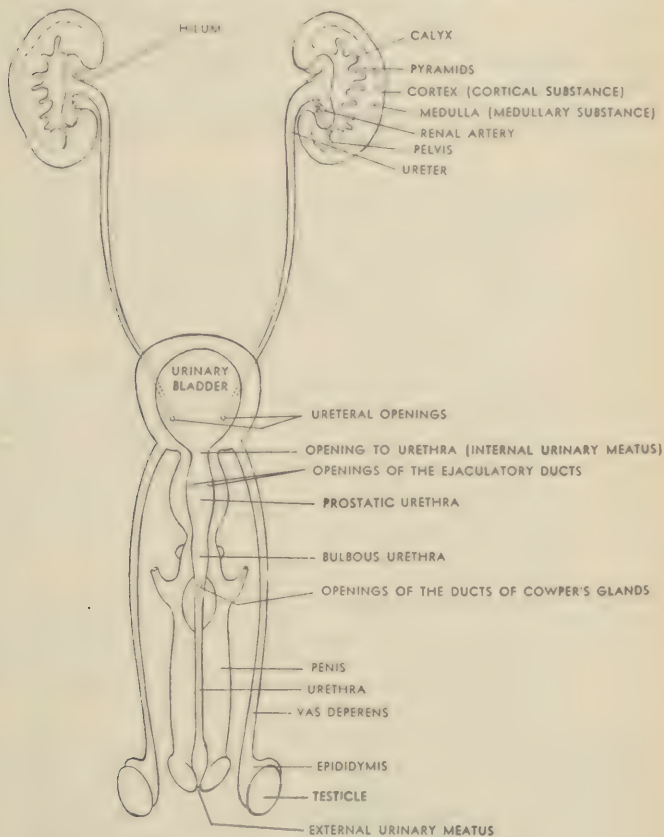
Figure 83. Cross Section Through the Right Ear (Front View).

*The ear.* The hearing apparatus consists of an external ear, a middle ear, and an internal ear. The *external ear* collects the sound waves and directs them through a canal to the middle ear. This canal is called the external auditory canal and is a tube about an inch long, somewhat curved and lined with skin containing a few hairs. These hairs and the waxy substance secreted by a few glands in the skin of the canal tend to prevent entrance of foreign particles. At the inner end of the auditory canal is the ear drum (tympanic membrane) which separates it from the middle ear. Sound waves are directed against this shiny, taut membrane.

*The middle ear* is a small, irregular body cavity in the skull, separated from the external ear by the tympanic membrane and from the inner ear by a thin, bony wall with two small openings. Inside the middle ear and stretched across the gap from the ear drum to one of the openings into the internal ear are three small, movable bones called the hammer (malleus), the anvil (incus), and the stirrup (stapes). The middle ear is connected to the pharynx by the auditory (Eustachian) tube. Ordinarily, this tube is closed by the pressure of the tissue of the throat, but, upon swallowing, it

opens and allows air to enter the middle ear. In so doing, equal air pressure is maintained between the inside and outside of the ear.

The *internal ear* is a bony labyrinth (peculiar-shaped cavity) in the temporal bone containing a communicating



**Figure 34. The Male Urinary System.**

vestibule or passage to the middle ear, the cochlea (a snail-like shell spiral tube of two and three-fourths turns), and the semicircular canals (bony channels). The organ of Corti is located on a membrane in the cochlea.

The *mechanism of hearing* is as follows: The sound waves are collected by the external ear and passed through the external auditory canal to the ear drum. These impulses are transmitted across the middle ear by the three small bones

to the internal ear. Impulses received set in motion the fluid filling the cochlea and stimulate, through the vibrating fluid, the sensory cells of the Organ of Corti. These sensations are conducted to the brain through the auditory nerve.

**208. The Control of Balance.** The slightest movement of the head changes the distribution of pressure created within the semicircular canals. This change is transmitted by the vestibular nerve to the brain, which interprets the position of the body and brings about the necessary changes to maintain equilibrium, or balance.

**209. The Male Genito-Urinary System.** This system includes the urinary system and the reproductive (male genital) system.

The *urinary system*. The urinary system includes the following organs: the two kidneys which make urine from the waste products removed from the blood; the two ureters—small ducts that convey the urine away from the funnel (pelvis) of the kidney; the bladder—a reservoir for urine; and the urethra—a tube through which the urine passes from the bladder to the meatus (tip) of the penis where it is expelled from the body.

The *kidneys* are two bean-shaped organs between four and five inches in length, one on each side of the spinal column in the back of the abdomen. The concave (indented) side is turned toward the spine. Near the center of the concave side is a fissure called the *hilum*, which contains the pelvis, ureter, blood vessels, lymph vessels, and nerves going to and from the kidney. Here the ureter, which takes away the urine, has its origin. There is one ureter for each kidney. They are small tubes which carry the urine from the kidneys to the bladder.

The *urinary bladder* is a hollow muscular organ lying in the lower portion of the abdomen just behind the pubic bone. The ureters enter by separate openings at the lower posterior portion of the bladder. As the kidneys secrete the urine, it passes on to the bladder where it is stored to be emptied voluntarily at intervals. The opening of the urethra is in the anterior lower portion of the bladder.

The *urethra* is the tube through which the urine passes from the bladder when the individual urinates. It passes through the prostate gland and through the penis.

Normal *urine* is a transparent, yellowish liquid with a characteristic odor and a specific gravity of 1.020 (weight of 1 cc). The quantity of urine may be increased by drinking a large amount of liquid, decreased perspiration, nervousness, and certain diseases. The presence of abnormal constituents in the urine, such as albumin, glucose, indican, acetone, casts, calculi, pus, and blood, is an indication of some disease or injury of the body.

The *male genital system*. The male organs of reproduction are the two testicles and their accessory organs, the two vasa deferentia, the two seminal vesicles, two ejaculatory ducts, two spermatic cords, the prostate, and the penis and urethra.

The *testicles* are two ovoid glandular organs which lie in

a pouch of skin, the scrotum. They are covered with a thin membrane that doubles back on itself to line the scrotum. The testicles before birth develop in the abdominal cavity and descend into the scrotum, usually just before birth. The passageway closes up in the majority of cases, but sometimes it remains open or the closure is so weak that the intestines may descend along the inguinal cord, causing a hernia (rupture). A hernia is not the result of venereal disease. The testicles have two important functions—the formation of the male cells (spermatazoa) and the secretion of the substance (a hormone) necessary for the development of sexual characteristics in the male.

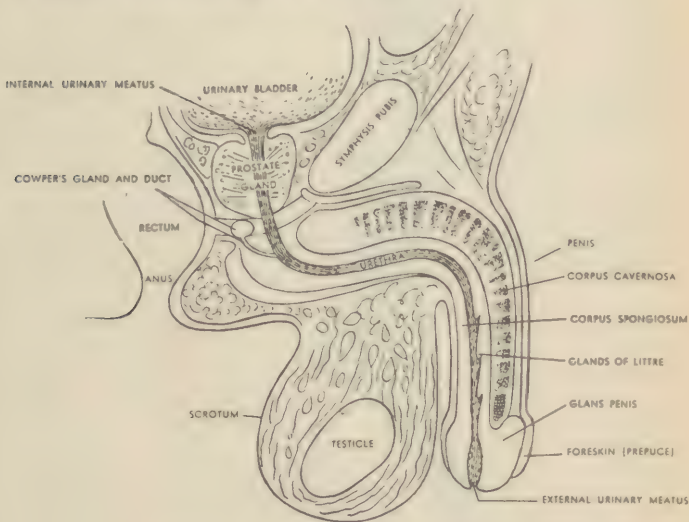


Figure 85. The Male Genital System.

When the spermatazoa are formed, they pass into a long, coiled tubule on the back of the testicle known as the epididymis. This tube measures about 20 feet in length, but is coiled up so that it takes up little space. The tube of the epididymis is continued in a more direct channel as the vas deferens to a membranous pouch, the seminal vesicle (one on each side) lying between the base of the bladder and the rectum. These vesicles act as a reservoir for the fluid containing the spermatazoa, to which they add another secretion. They discharge the fluid through the small ejaculatory ducts into the back part of the urethra. At the same place where these ducts empty into the urethra, the prostate gland empties a secretion which facilitates mobility of the spermatazoa. The prostate gland is shaped like a chestnut and surrounds the urethra just as it leaves the bladder.

The penis is a muscular organ containing relatively large

veins and attached to the lower part of the abdomen. It is suspended in front of the scrotum. At the end of the penis is a slight enlargement known as the glans penis in which the urethral opening (meatus) is located. During sexual intercourse the seminal fluid is discharged through the urethra and directed into the female genital organ by the penis which is turgid because of distension due to an increased amount of blood in its venous spaces.

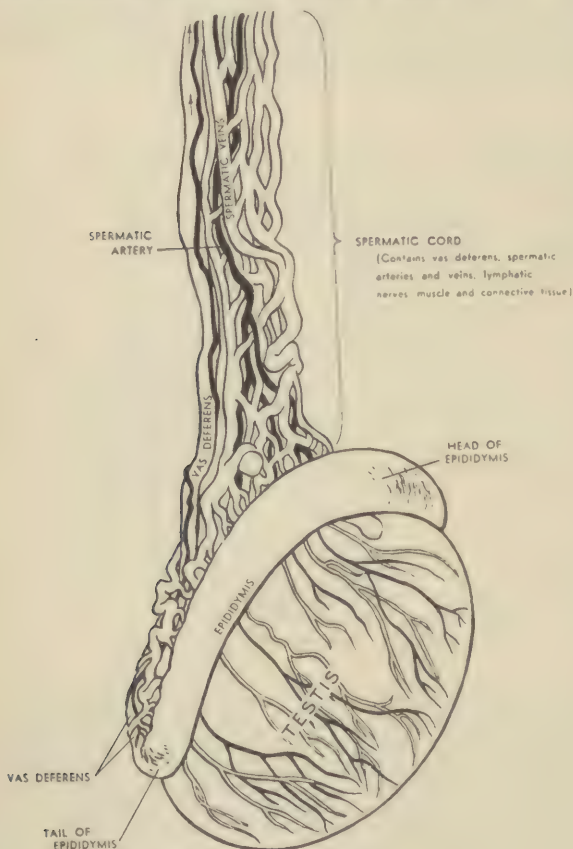


Figure 86. The Testicle.

Semen is the fluid produced as a result of secretions from various sexual glands in the male. The reproductive elements in the semen are the male cells produced in the testicle; the other constituents are derived from the seminal vesicles, prostate gland, and Cowper's glands. Cowper's glands are

two small bodies about the size of a pea, situated one on each side of the prostrate gland. They secrete a viscid fluid which empties into the urethra.

*The endocrine system.* The endocrine system is that group of organs and tissues which produce internal secretions. Some of these glands are ductless, and their secretions are absorbed directly into the blood, or lymph. The active substances contained in their secretions are called *hormones*. Hormones influence such functions as growth, reproduction, and metabolism. The most important of the ductless glands are: the thyroid, the parathyroids, the thymus, the suprarenal glands (adrenals), the pituitary body, the pineal body, the gonads (testicles and ovaries), and the spleen. Special cells in the pancreas, liver, stomach, and intestines also furnish internal secretions.

The thyroid gland, in the neck, is one of the largest ductless glands. Overactivity of this gland causes nervousness, loss of weight, rapid heart action, and many other symptoms. Insufficient secretion of this gland causes mental dullness, retardation of growth of the long bones, coarse hair, rough dry skin, and other symptoms. The above is cited to show that proper function of the endocrine glands has an important bearing on the good health of the individual. The disfunction of one may create either an increased or decreased function of another ductless gland in the endocrine system.

## CHAPTER 15

### FIRST AID

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#### SECTION I

#### GENERAL

**210. General.** First aid consists of the temporary emergency treatment given in a case of sudden illness or accident before the services of a medical officer can be secured. This temporary care if intelligently given will often save a life. In all cases first aid, properly administered, will reduce mental and physical suffering and thereby place the patient in the medical officers hands in a better condition to receive further treatment. Very often the only first-aid care that is necessary is to prevent further injury to the patient by well-meaning but ignorant meddlers. Unit commanders are responsible that members of their units receive adequate training in first aid.

**211. General Directions.** The following precautions apply to the application of first aid in any situation:

a. Do not move the patient until the extent of the injury is determined. Keep the patient lying in a comfortable position, with the head level with the body. Many types of injuries require skilled preparation before they can be safely transported to a hospital. Hurried transportation by unskilled persons may aggravate injuries or even prove fatal to the patient.

b. Keep cool; do not handle the patient hurriedly or roughly; keep bystanders away from the injured.

c. Keep the patient warm; be sure he is covered and is not being chilled from contact with the ground.

d. Do not give liquids to an unconscious patient; they may enter the windpipe and strangle him.

e. Do not try to do too much; if the injury appears to be a serious one, bring medical assistance to the patient rather than transporting the patient to a hospital.

## SECTION II

## TREATMENT OF WOUNDS

**212. General.** *a.* A wound is a break in the skin or in the mucous membrane of one of the body cavities. Incised wounds are made by sharp cutting instruments such as knives, razors, and broken glass. Lacerated wounds are irregular and torn. They are caused by contact with angular surfaces such as shell fragments or by machinery. Puncture or stab wounds are caused by penetrating objects such as nails, wire, or bullets.



Figure 87. First-Aid Treatment.

*b.* Infection and severe bleeding are the principal dangers from any type of wound. Rapid bleeding requires immediate attention. In most cases bleeding is readily controlled if fundamentals are known and applied. Infection can incur whenever the skin surface is broken. The size or location of the wound is not related to the possibility of infection; a skin puncture with an ordinary pin may become infected. A wound should never be touched with anything except sterile dressings or instruments. The contact of unclean hands, bandages, or instruments may infect a wound that otherwise is relatively clean.

**213. Application of First-aid Treatment.** *a.* Steps in treatment:

(1) Expose the wound completely by removing, cutting, or ripping the clothing or footwear.

(2) If an antiseptic such as iodine is available, apply it to the wound and to the skin for 1 inch around the wound. If no antiseptic is available, this step is omitted.

(3) Apply a sterile dressing to the wound, preferably one from a first-aid packet.

(4) Take additional steps to control bleeding if necessary.

(5) Try to prevent shock by keeping patient warm and quiet.

(6) Have the wound re-dressed by a medical officer as soon as possible. Special surgical treatment or the use of sera against tetanus and gas gangrene may be necessary.

*b. Precautions.* In order to avoid infection or aggravation of the injury, the following precautions should be observed:

(1) Do not touch the wound with the hands, mouth, clothing, or other unclean object.

(2) Do not wash the wound with any solutions such as soap and water.

(3) Do not massage or squeeze the wound. This might start severe bleeding and certainly will injure the tissues.

(4) Do not attempt to explore the wound or remove blood clots.

(5) Never use iodine in or around the eyes, or in a body cavity.

*c. Use of the first-aid packet.* (1) The first-aid dressing is carried by all military personnel. It is contained in a sealed metal container, whose seal must be broken to remove the dressing. The dressing consists essentially of a thick pad of absorbent material to which are attached two double-tailed rolls of bandage. When removing the wrapper and applying the dressing, the hands should touch only the bandage and the papered side of the dressing. The paper is colored to aid in its recognition.

(2) The unpapered side of the dressing is applied to the wound. The bandage is then snugly secured about the limb or part by tying or pinning the ends. If a missile has gone completely through an arm or leg, a dressing should be applied to one of the wounds without unrolling its bandage. A second dressing is then applied to the other wound, and its bandage used to secure both dressings.

(3) It may be necessary to use the contents of several packets to cover very large wounds.

**214. Hemorrhage.** *a. Varieties.* There are three varieties of hemorrhage (bleeding) as follows:

(1) *Arterial.* An arterial hemorrhage is bleeding from an artery. The loss of blood may be very rapid. The blood spurts from the wound with each pulsation of the heart beat and is bright red in color.

(2) *Venous.* A venous hemorrhage is bleeding from the veins. The flow of blood is steady and the color is dark red.

(3) *Capillary.* A capillary hemorrhage means bleeding from very small blood vessels and is manifested by oozing of blood from the wound. It is ordinarily not severe.

*b. Control of hemorrhage.* Most mild hemorrhages will cease by natural means. This results from a blood clot forming in the wound, preventing the further escape of blood. More severe hemorrhages, particularly arterial and venous ones, usually require one or more of the following artificial measures for control:

(1) *Elevation.* Elevating a wounded extremity will aid in the control of hemorrhage by decreasing the volume of blood in the injured part and thereby encouraging the natural tendency to cessation of bleeding.

(2) *Pressure.* (a) *Direct pressure.* Direct pressure is the most common and safest method for the control of bleeding. If sterile gauze or bandage material is available, it can be

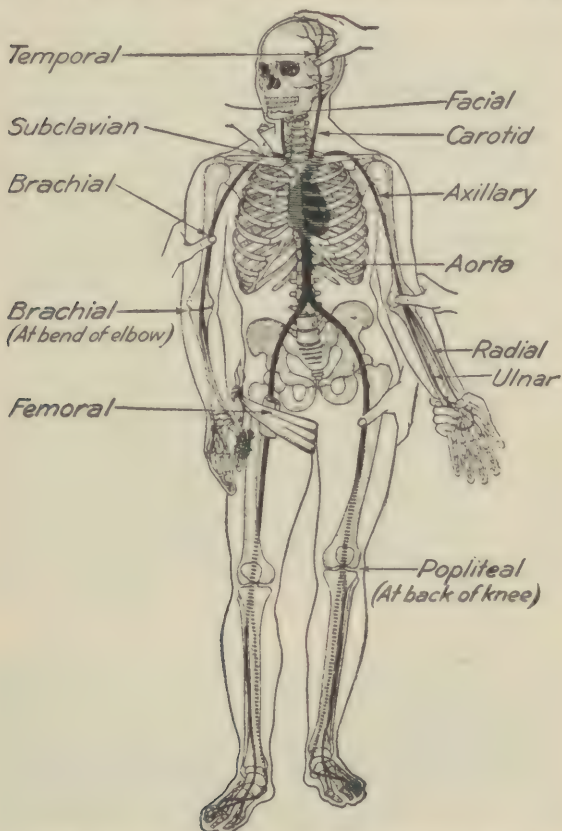


Figure 88. Course of Arteries and Pressure Points.

used for direct pressure on the wound and held in place until a dressing is applied or a tourniquet adjusted. The dressing itself can be adjusted so as to exert some pressure.

(b) *Pressure with the fingers.*

1. When direct pressure on the wound does not control the bleeding, pressure upon the blood vessel between the heart and the wound is necessary. At certain places in the

body, large arteries lie near bones and may be compressed to decrease the flow through them. Pressure may be applied with the fingers until a tourniquet can be applied.

2. The following are the principal pressure points:

(a) *Scalp.* Apply pressure with the tips of the fingers in front of the ear just above where the lower jaw can be felt working in its socket. A branch of the temporal



Figure 89. Course of Arteries and Pressure Points—Head and Neck.

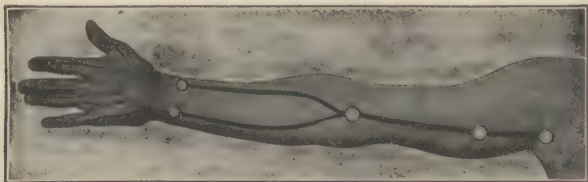


Figure 90. Course of Arteries and Pressure Points—Upper Extremity.

artery crosses the temple on the line between the upper border of the ear and the upper border of the eyebrow.

(b) *Neck and head.* Press the thumb and fingers deeply into the neck in front of the strongly marked muscle which reaches from behind the ear to the upper part of the breastbone.

(c) *Shoulder and armpit.* Press the thumb deeply

into the hollow behind the middle of the collar bone. This compresses the large subclavian artery.

(d) *Arm or hand.* Press outward against the bone just behind the inner border of the large muscle (biceps) of the arm. This compresses the brachial artery.

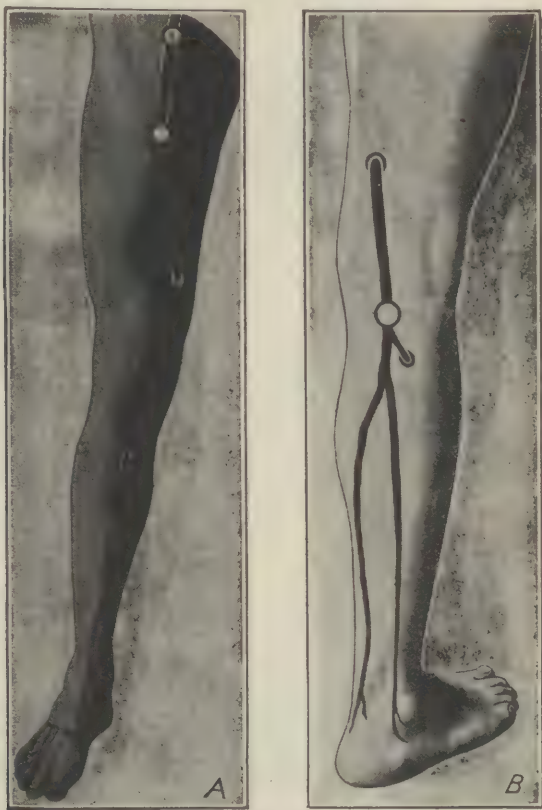


Figure 91. Course of Arteries and Pressure Points, Lower Extremity: A, front view; B, back view.

(e) *Thigh, leg, or foot.* Press strongly with the thumbs at the upper part of the inside of the thigh where the large artery passes over the bone. This compresses the femoral artery.

(c) *Tourniquet.*

1. The use of a tourniquet is a dangerous procedure. One should not be employed if bleeding can be stopped by any other means. A tourniquet consists of a pad which is pressed against an artery, and a strap which is used to obtain



**Figure 92. Pressure Points: A, Temporal Pressure Point; B, Carotid Pressure Point; C, Brachial Pressure Point; D, Femoral Pressure Point.**



**Figure 93. Use of Tourniquet Application.**

pressure on the pad. Medical Department personnel carry issue tourniquets as part of their equipment, but satisfactory ones can be improvised. The pad may consist of a roll of bandage, a stone wrapped in a handkerchief, or any other hard, smooth object. The strap may consist of a bandage, a cravat, a belt, or a handkerchief. The strap should be at least 1 inch wide so that it will not cut into the skin.



Figure 94. Application of Tourniquet to Thigh.

2. For the arm and hand the tourniquet pad is applied about a hand's breadth below the armpit. For the thigh and leg it is applied about a hand's breadth below the groin. After tying the strap loosely around the limb, the required degree of pressure is made by passing a stick or bayonet under the hand but opposite the pad, and twisting it so that the pad is pressed down firmly. The stick is anchored with a bandage. The pressure exerted should be as light as will stop the hemorrhage.

3. Since a tourniquet cuts off the entire blood supply to the injured part, precautions must be taken that the tourniquet is not left on too long or the limb will die (gangrene). It should be loosened at least every 20 or 30 minutes. It should not be covered with a bandage or splint or it may be forgotten. Some sort of tag should be attached to the man marked "tourniquet" and giving the date and hour when applied.

## SECTION III

## SHOCK

**215. Shock.** *a. General.* Shock is a profound depression of all physical and mental processes. This condition usually results from injury, but it may be caused by exposure, bleeding, fatigue, hunger, or extreme emotion. Some degree of shock follows all injuries; it may be slight, lasting only a few minutes, or it may be prolonged and end fatally. Where an injury is severe it can safely be assumed that a corresponding degree of shock will be present. Even if evidence of shock has not appeared after severe injury, it is well to anticipate it and to help prevent it by instituting shock treatment.

*b. Symptoms of shock.* Part or all of the following symptoms may be present:

(1) The patient feels weak, faint, and cold, and may feel nauseated.

(2) The face is pale and pinched, and has an anxious and frightened appearance.

(3) There is listlessness and possibly a general loss of sensation with beginning stupor.

(4) The skin is cold and clammy.

(5) The breathing is irregular and sighing.

(6) The pulse is weak and rapid.

*c. Treatment of shock.* (1) Place the patient flat on his back with the head low.

(2) Control the hemorrhage if any is present.

(3) Loosen all constricting clothing.

(4) Avoid unnecessary movement of the injured part or of the patient; pain will result and shock will increase. Move patient no more than absolutely necessary before medical assistance arrives. If movement is necessary, apply the other shock treatment measures before moving the patient.

(5) Apply heat to the body. This is the most important factor in preventing and treating shock. Additional clothing and blankets may be used. External heat may be applied by means of bottles or canteens filled with hot water, hot stones, or hot bricks. These hot objects may be placed between the legs, under the armpits, and beside the waist. They should not be placed directly against the bare skin or against very thin clothing as a burn may result. Care should be taken not to expose the patient to chilling while he is being examined and treated.

(6) Stimulants given by mouth are valuable but cannot be used in all cases. They should never be given to unconscious patients, patients who are bleeding, or patients with skull fracture, apoplexy, sunstroke, or a wound of the abdomen. The best stimulants are hot drinks such as water, coffee, tea, or chocolate. A teaspoonful of aromatic spirits of ammonia in water is also valuable.

(7) Treatment of shock must be continued for a considerable period of time. The patient should be watched constantly until evidence of shock has disappeared.

## SECTION IV

## FRACTURES, DISLOCATIONS, AND SPRAINS

**216. Fractures.** *a. General.* (1) A fracture is a break in a bone. A simple fracture is one in which there is no wound extending from the broken bone through the skin. A compound fracture is one in which the wound extends from the broken bone through the skin and therefore is exposed to the dangers of infection from the outside. A complicated fracture is one where there is damage to adjoining large vessels, nerves, or muscles which is a contributing factor in causing shock.

(2) In no injury is the ultimate outcome more influenced by the character of first-aid treatment than in fractures. Improper handling or immediate transportation prior to immobilization of the limb may produce or aggravate shock and deprive the patient of a chance for recovery. All fractures or suspected fracture cases should be handled gently. It is equally as important to know what not to do as to know what to do. In splinting, two mechanical principles are involved:

(a) *Fixation* to obtain rest for the injured parts, to retain them in proper alinement, and to favor their union.

(b) *Traction* to obtain muscular relaxation with the object of diminishing pain and overcoming muscular contraction which might result in faulty position of the injured parts, to secure proper alinement by a pull in the direction of normal anatomical lines, and to prevent the displacement of bony fragments with consequent injury to nearby nerves, muscles, and blood vessels.

(3) In certain cases, immediate movement of the patient is very detrimental. The first-aid treatment should be administered where the patient lies; medical assistance should be brought to the patient rather than the patient transported to the medical officer. This is especially true of fractures of the thigh, pelvis, or back and in all cases when there is evidence of shock. In any event, depending on the severity and nature of the case, one or more of the general first-aid measures are usually indicated.

*b. Signs and symptoms of fracture.* Part or all of the following signs and symptoms may be present:

(1) Pain and tenderness at the point of fracture.

(2) Partial or complete loss of motion.

(3) Deformity.

(4) Swelling and later, discoloration.

(5) Crepitus or grating may be felt, but no attempt should be made to produce this sensation.

*c. First-aid treatment.* (1) *General.* Splint the patient where he is. Do not transport or move him about until some type of splint is in position. Except where the bone is protruding, straighten the limb by pulling gently but steadily upon the lower end of the extremity. Maintain this steady traction and support the limb on either side of the fracture until a splint is applied. A splint should be as wide as the limb, and long enough to immobilize the next joint in either

direction from the fracture. If no issue splints are available, temporary splints may be improvised from many common materials such as shingles, pieces of board, bayonets or scabbards, pieces of tin, mesh wire, bundles of twigs, rifles, folded blankets, pillows, or any other rigid or semirigid materials. It is important that splints be well padded on the side toward the skin, and that they be securely bound by bandaging or tying them at several points above and below the fracture but not over the fracture. Caution must be exercised that they are not so tightly bound as to cut off the circulation as swelling of the limb occurs. The splint and limb should be examined at least every 30 minutes to be sure the circulation is not cut off.



Figure 95. Sling Made From Ordinary Bandages.

(2) *Treatment of fractures with wounds.* In fractures with wounds or hemorrhage, the wound should be dressed and hemorrhage controlled before a splint is applied. Even if bleeding is slight, it is a safe precaution to place a tourniquet loosely about the part so that, if bleeding should start, it can be quickly controlled. If the bone is protruding through the skin, it should not be pushed back with the hands. Apply iodine to the exposed bone and to the wound. Place a sterile dressing over the wound. Then apply traction to the extremity.

(3) *Slings.* Fractures of the upper extremities should be supported by a sling after splinting. A triangular bandage makes the best sling. However, arm slings may be made from ordinary bandages, or may be improvised from the ordinary clothing by using safety pins to fasten the coat sleeve to the



Figure 96. Sling Made From Ordinary Clothing.

front of the coat to support the arm. The coat flap may be used for the same purpose by pinning it, or by punching a hole through the lower edge of the flap and buttoning this to a coat button.

(4) *Application of splints.* (a) *Fracture of the forearm.* With the forearm flexed to a right angle, thumb up, apply a splint to the inner surface, extending to the tips of the fingers, and another to the outer surface, extending to the wrist.

(b) *Fracture of the upper arm.* Apply two splints from the shoulder to the elbow, one in front and the other behind, if the lower part of the bone is broken; apply to the inner and outer sides, if the fracture is in the middle or upper part; support by a sling.

(c) *Fracture of the collar bone.* Flex the forearm to a right angle in front of the body and place in a sling.

(d) *Fracture of the leg or ankle.* Apply two splints, one



**Figure 97. Splints for Forearm.**



**Figure 98. Splints for Leg or Ankle.**

on the outside, the other on the inside of the limb, extending from the knee to beyond the foot.

(e) *Fracture of the thigh.* Administration of first-aid treatment where the patient lies is the method of choice. Splinting should not be attempted by the inexperienced unless unusual circumstances make it necessary that the patient be moved some distance at once. Proper traction applied to the limb below the fracture is absolutely essential to provide effective first-aid treatment which will permit transportation without danger of producing further injury and shock. To do this requires a special splint applied by one experienced in its application. If the patient must be moved, carry gently as possible, paying special attention to the support of the injured limb in the extended position.



Figure 99. Splints for Hip or Pelvis.

(f) *Fracture of the hip or pelvis.* The patient should be prepared for transportation by a medical officer. If absolutely necessary to move him, a splint should be applied, extending from the armpit to the foot. This should be securely anchored at several points.

(g) *Fracture of neck or back.* The patient should not under any circumstance be moved except by skilled medical personnel. In fracture of the neck the head should be gently straightened and steadied by the hands or by pads on either side of the neck. In fracture of the back it is best to lay the patient flat on his stomach.

**217. Dislocations and Sprains.** a. *General.* When a bone gets out of place at a joint, the condition is called a dislocation. When the ligaments about a joint are torn or bruised, the condition is called a sprain. In these conditions the pain is usually severe, marked swelling rapidly occurs, and shock may be present. It is often impossible to dis-

tinguish a sprain or dislocation from a fracture without an X-ray examination.

**b. Treatment.** (1) Elevate the part. If this is an upper extremity, elevate by means of a sling. If it is the lower extremity, have the patient in the prone position with pillows, coats, or other support under the raised leg.

(2) Apply cold applications to the site of injury early to retard swelling. If the injury is over 2 hours' old, hot applications are more valuable. Plain hot water is as efficient as any solution for this purpose.

(3) Keep the patient warm. If shock is present, treat it.

(4) When in doubt, treat the case as a fracture and apply splints, especially if the patient must be transported.

(5) Never attempt to reduce a dislocation as permanent damage may be done.

## SECTION V

### ARTIFICIAL RESPIRATION

**218. General.** Asphyxia, suffocation, or cessation of breathing occurs most frequently in drowning, electrical shock, and gas poisoning. The safest and most effective method of applying artificial respiration is the prone pressure or Schaefer method. Oxygen respirators, which are available at many bathing beaches and military stations, are very efficient in trained hands but, for unskilled personnel, are less satisfactory than the Schaefer method.

**219. Drowning. a. General.** Being under water for over 5 minutes is usually fatal, but an effort to revive the apparently drowned should always be made unless it is known that the body has been under water for a long time. It is very important that artificial respiration be started at the earliest possible moment after the patient has been removed from the water.

**b. Technique of resuscitation.** (1) Lay the patient face down, force his mouth open, pull the tongue forward, and remove false teeth, juice, vomitus, or debris from his mouth and throat.

(2) Raise him by the hips in order to drain the water from his lungs.

(3) Lay him on his belly, preferably at a spot where his head will be lower than his feet. One of his arms should be extended over his head, the other bent at the elbow so that his face can be turned to the side and rest on the hand.

(4) Kneel astride the patient's thighs, with your knees placed at such a distance from his hips as will allow you to exert the pressure on his lower ribs as described below. Place the palms of your hands on the small of his back with your fingers on his lower ribs, your little fingers just touching his lowest rib, with your thumbs and fingers in natural position and the tips of your fingers out of sight just around the sides of his chest wall. The heels of the hands should be placed as far from the backbone as possible without slipping off.

(5) With your arms held straight, swing forward slowly so

that the weight of your body is gradually brought to bear upon the patient. Do not bend your elbows. This operation should take about 2 seconds.

(6) Now immediately swing backward so as to remove all pressure completely and suddenly. Leave the hands in place if possible.

(7) After about 2 seconds repeat the operation. The cycle of compression and release should take about 4 or 5 seconds and should be repeated at the rate of 12 to 15 times per minute.



Figure 100. Artificial Respiration, First Position.

(8) Continue the operation without interruption until natural breathing is restored, or until the subject is unquestionably dead. Remember, many patients have died because artificial respiration has been stopped too soon. Always continue the operation for 2 hours or longer.

(9) Aside from the resuscitation, the most valuable aid that can be rendered is keeping the patient warm. After artificial respiration has been started, have an assistant loosen the clothing and wrap the patient in any clothing that is available. Use hot brick, pads, heaters, or similar means, but be sure the person is not burned by your treatment.

(10) When the patient revives he should be kept lying down and not allowed to stand or sit up; this will prevent undue strain on the heart. Stimulants such as hot tea or coffee, or aromatic spirits of ammonia, can be given as soon as the patient is perfectly conscious.

(11) At times a patient, after temporary recovery of respiration, stops breathing again; artificial respiration should be resumed at once.

(12) Due to the length of time this operation may be kept up, one, two, or more operators may be necessary. A change

of operators can be made without loss of rhythm of respiration. If this point is remembered no confusion will result when the change occurs and the respiratory count will be kept even. The great danger is stopping artificial respiration prematurely. In many cases, breathing has been established after 3 or 4 hours of artificial respiration, and there are instances where normal breathing has been reestablished after 8 hours. The ordinary and general tests for death should not be accepted; a medical officer should make several careful examinations at various intervals before the procedure is allowed to be stopped.



Figure 101. Artificial Respiration, Second Position.

**220. Electrical Shock.** The rescue of the victim from a live wire is always dangerous. If the switch is near, turn the current off, but lose no time in looking for the switch. Use a dry stick, dry clothing, dry rope, or some other dry non-conductor in removing the victim from the wire. Start artificial respiration immediately. Do not regard early stiffening as a sign of death; always keep up the artificial respiration for several hours.

## SECTION VI

### GAS CASUALTIES

**221. Peacetime Gases.** The chief poisonous gases encountered in civil life are illuminating gas, carbon monoxide (motor exhausts), charcoal, and mine gases. The first thing to do in all of these gases is to get the patient into fresh air. The fresh air of a warm room is preferable to extremely cold air. If breathing is weak or irregular or has stopped, artificial

respiration should be started and continued until normal respiration has been established. A medical officer should always be called, since the patient may die even after breathing is apparently normal.

**222. Gases in Warfare.** *a. General.* Prompt and proper first-aid treatment for gas casualties is of vital importance. Proper treatment will minimize the effects of the gas and will often prove the deciding factor in the outcome of the case. There are certain simple rules which all individuals must know. Unit commanders are responsible for the training of members of their commands in first aid for gas casualties. They are also responsible for the intelligent early handling of gas casualties prior to evacuation.

*b. First-aid rules.* The detailed protection against and treatment for the various gases used in warfare are given in FM 21-40. The following simple general rules should be understood by all individuals:

(1) Wear mask and gloves when handling a gassed man. If gloves are not worn, wash hands thoroughly with soap and water, or rub them with dry lime, after handling such cases.

(2) Remove the casualty or the suspected casualty from the contaminated area as quickly as possible.

(3) Remove the patient's clothing and equipment unless undue exposure to cold will result, but leave his mask on until certain that the air is free from gas.

(4) If possible, remove all gassed cases from woods or low ground to knolls or hillsides. Do not carry them into dugouts or cellars, since most war gases are heavier than air.

(5) Do not allow cases affected by lung-irritant gases to walk or talk. The apparent mildness of these cases is often misleading.

(6) Remember that the clothing, equipment, or bodies of cases gassed with vesicants may contaminate anything with which they come in contact. Thus blankets, litters, or areas on the ground occupied by such cases should be avoided by ungassed persons.

(7) Prevent patients with vesicant-gas injuries from rubbing their eyes, mouths, or genitals. Do not bandage the eyes.

*c. Special measures.* See FM 21-40.

(1) *Lacrimators.* Men who are lacrimated do not require evacuation as casualties. They only need to leave the contaminated atmosphere and face the wind, allowing it to blow into their eyes. They should not rub their eyes; their clothing and equipment should be loosened so as to get rid of entrapped gas. Bathing the eyes in cold water or with a weak boric acid or sodium bicarbonate solution will aid.

(2) *Irritant gases (sternutators).* These agents, such as DM, are not lethal in field concentrations. They may, however, cause such disability as to require evacuation.

(a) Remove patient from the contaminated atmosphere, keep away from heat, and remove outer clothing. Flush the nose and throat with a weak solution of sodium bicarbonate (baking soda) or of ordinary salt.

(b) Breathing chlorine in low concentrations tends to alleviate the irritation. In lieu of other facilities, this may

be accomplished by breathing from a bottle containing bleaching powder (chloride of lime), or from a mixture of alcohol, chloroform, and ether. The exposed surface of the body should be washed with soap and water.

(3) *Lung irritants.* In order to reduce his oxygen requirements to the minimum possible, a lung irritant casualty should be made to lie down and not allowed to walk to an aid station even though he insists that he is able to do so. He should, as soon as possible, be removed from the contaminated atmosphere, his equipment removed, his clothing loosened, and he should be kept warm. In addition to wrapping him in blankets, nonalcoholic stimulants such as hot coffee or tea should be given; and he should be evacuated as soon as possible as an absolute litter case.

(4) *Vesicants.* All of the agents classed as "vesicants" have also a powerful lung irritant action.

(a) *Mustard gas.* The casualty should be immediately taken out of the contaminated atmosphere or area and his contaminated clothing removed. Should only portions of the clothing be splashed with liquid mustard, these can be cut away. If the face has been exposed, wash the eyes and rinse the nose and throat with a saturated boric acid, weak sodium bicarbonate, or common salt solution. If the vapor has been breathed, the individual should be treated and handled as a lung irritant casualty. First aid must be prompt for little can be done later than 30 minutes after exposure.

Vapor burns on the skin may be lessened or even prevented by thorough cleansing with soap and water (preferably hot) immediately after exposure. Cleansing the exposed parts with gasoline or kerosene prior to the use of soap and water will facilitate the removal of all traces of the gas.

Mustard burns or skin areas wet with liquid mustard should be immediately and repeatedly swabbed with a solvent such as kerosene, gasoline, any oil, alcohol, or carbon tetrachloride (pyrene).

Fresh cloths should be used and the spreading of the contamination should be avoided. After cleansing with the solvent, the affected parts should be thoroughly washed with soap and hot water. Cloths used in removing the liquid mustard will be contaminated and should be burned or buried after use. A weak, freshly prepared solution of chloride of lime in water may be used in place of the oily solvent; this solution is itself very irritating to the skin and must, therefore, be removed by subsequent washing with soap and water.

Fresh, uncontaminated clothing must be supplied where necessary. All casualties should be evacuated as soon as possible.

(b) *Lewisite.* To be of any value against lewisite, first aid measures must be instituted almost immediately. The treatment is similar to that for mustard.

In lewisite burns, whether from vapor or liquid, the danger of poisoning from absorbed arsenic far overshadows the effect of the actual burn; it is, therefore, imperative to neutralize, if possible, any arsenic present and not yet absorbed. This may be accomplished by the immediate application of some

hydrolyzing agent. A 5 per cent aqueous solution of sodium hydroxide (caustic soda) has been found very efficient if applied soon enough.

Following this, or in the absence of the hydroxide solution, vapor burns should be thoroughly cleansed with soap and water and then dressed with a ferric hydrate paste. The paste should be spread on thickly, covered with gauze, and allowed to remain for 24 hours. Following the hydroxide solution and cleansing with soap and water, liquid burns should be repeatedly swabbed with some oily solvent as suggested for mustard, again washed with soap and water, and dressed.

Fresh, uncontaminated clothing must be supplied where necessary. All casualties should be evacuated as soon as possible.

(5) *Incendiaries.* (a) For burns from incendiaries other than white phosphorus, treatment and handling are the same as for ordinary heat or fire burns.

(b) For phosphorus burns, immerse the affected part in water to stop the burning of the phosphorus and pick out the solid particles from the flesh. Wet cloths, mud, or damp earth may serve the purpose if immersion in water is not possible. As phosphorus melts at approximately 111° F., if hot water is used, the melted particles may be removed with a cloth or sponge.

The prompt application of an approximately 2- or 3-per cent solution of copper sulphate in water will form a thin coating of copper phosphides on the phosphorus particles, which will stop their burning at once. The coated particles can then be picked out from the flesh. The copper sulphate solution should be applied by soaking a pledget of cotton, a sponge, or a piece of cloth in the solution and then placing it on the phosphorus. A minute or two is sufficient time for the formation of the metallic covering coat. After removal of the phosphorus, the burns should be dressed. All severe cases should be evacuated.

## SECTION VII

### INJURIES DUE TO HEAT AND COLD

**223. Burns.** *a. General.* Burns may be caused by dry or moist heat, electricity, and chemicals. They are classified in degree according to the depth to which the tissues are injured. Shock and infection are to be feared in dry burns.

(1) *First degree.* The skin is reddened but there is no blister.

(2) *Second degree.* The skin is blistered.

(3) *Third degree.* The skin is destroyed or charred, as from contact with flames.

*b. Treatment of burns.* (1) *General rules.* The following general rules apply to the first-aid treatment of all burns:

(a) Do not pull the clothing from the burned part; snip or cut it off.

(b) Do not break or prick blisters if present.

(c) Treat shock early in all severe burns.

(d) When possible, protect the burn quickly with a sterile dressing, applying medication as indicated in (2) to (5) below.

(2) *First-degree burns.* The treatment is directed toward the relief of pain since the skin is unbroken and there is no danger from infection. Any substance that will relieve the pain is satisfactory. An oily substance such as petrolatum (vaseline), olive oil, or castor oil is usable. Cold water or soda in water is soothing when immediately applied. It must be remembered that if the burn is at all serious, such as encountered in second- or third-degree burns, oily substances are not to be applied.

(3) *Second-degree burns.* Here the injury must be regarded as an open wound; only material that is known to be clean can be used. Remove the loose clothing, but do not try to remove material that adheres to the skin. The application of sterile gauze soaked in a solution of Epsom salts (2 tablespoonfuls to a pint of boiled water) is very good. The dressing should be kept moist and warm until further aid is obtained. The best treatment is application of gauze saturated with 2-per cent picric acid solution applied securely but not tightly. A 5-per cent tannic acid solution similarly applied is of equal value. Never apply iodine or similar substances to a burn, and never apply absorbent cotton to a burned surface. Shock is always present to some degree in every case.

(4) *Third-degree burns.* These are always serious and require medical attention promptly. The first-aid treatment consists chiefly of keeping the patient warm and treating shock. If medical attention can be obtained promptly it is best merely to lay a sterile dressing lightly on the wound. If over 30 minutes will elapse before help can be obtained, one of the dressings used for second-degree burns should be applied.

(5) *Chemical burns.* Burns caused by acids or alkalies should be washed with large quantities of water, preferably lukewarm, until the chemical is thoroughly removed. All clothing should be cut away with scissors. Apply a salve dressing after the chemical is completely removed, and secure a medical officer's services. Phenol or carbolic acid burns should first be washed with alcohol if available. Eye burns require careful attention. The best first-aid treatment is to flush the eye thoroughly with clean olive oil, mineral oil, or castor oil. If these are not available use water; a drinking fountain that throws a stream is excellent for this purpose. After washing, the eye should be covered with a moist dressing and further medical aid secured.

**224. Sunstroke and Heat Exhaustion.** Both these conditions are caused by excessive heat, but they differ entirely in their symptoms and treatment.

*a. Sunstroke.* (1) *General.* Sunstroke is a very dangerous condition usually caused by direct exposure to the rays of the sun, especially when the air is moist. The symptoms are headache, dizziness, oppression, and sometimes vomiting; the skin is hot and dry, and the face flushed; the pulse is rapid

and full; the temperature is high, often ranging between 107° and 110°. Unconsciousness usually occurs and the body becomes relaxed; however, convulsions may occur.

(2) *Treatment.* Remove the person to a shady, cool place if possible and loosen or remove the clothing. Lay the patient on his back with shoulders elevated. Apply cold to the head by means of wet cloths, ice bags, or ice. The brain cannot withstand the effects of high temperatures. Cool the body by giving cold baths for 20 minutes at a time combined with brisk massage of the limbs and trunk. Cold wet cloths or ice bags may be used. Wrapping the body in a sheet and pouring on cold water every few minutes is very effective. Do not overdo any of these procedures. Stop every few minutes to observe the effects on the patient. If the skin again gets hot repeat the treatment. Give no stimulant by mouth while unconsciousness lasts.

b. *Heat exhaustion* is caused by exposure to high temperature as encountered in boiler rooms, foundries, bakeries, and similar places. The first signs of heat exhaustion are dizziness, nausea, and uncertain gait. The face is pale, the body is covered with a profuse perspiration, and the skin is cold and clammy. Breathing is shallow, the pulse is weak, and the temperature may be normal or somewhat elevated. Fainting may occur, or prostration may become severe. Remove the patient to circulating cool air, place him in a supine position, and let him drink freely of cool salt water (1 teaspoonful of table salt in a pint of water). Call a medical officer if the patient does not recover promptly.

**225. Freezing.** a. *Frostbite.* (1) The symptoms of frostbite are cold in the part, then pain, and finally, loss of sensation. The affected part becomes white or bluish white.

(2) Slowly thaw the frozen part by using extra clothing, applying it to another part of the body, or wrapping it in cloths soaked in cool water. Do not expose frozen tissues to a hot stove or radiator. Do not rub the frozen part either with the bare hands or with snow; the tissues will be bruised and torn, and gangrene may result. Medical attention is usually necessary after frostbite.

b. *Unconsciousness.* When a man becomes unconscious from cold, if possible, carry him into a cool room, cover him well with blankets, and move his arms and legs gently but steadily. When consciousness returns, give him warm drinks and let him lie quietly.

## SECTION VIII

### POISONOUS BITES AND STINGS

**226. Snake Bite.** Treatment for snake bite should start immediately. The main effort is to prevent the poison entering the general blood circulation. If on a limb, a tourniquet should be tied around the limb just above the bite to increase the bleeding. A necktie, handkerchief, or bandage can be used as a tourniquet. It should be tight enough to prevent the blood flowing back through the veins, but not tight enough to prevent the blood flow in the arteries. In any event it should

not be left on for a period greater than 1 hour. Whether or not the bite is on a part of the body where a tourniquet can be used, a cross incision,  $\frac{1}{2}$  by  $\frac{1}{2}$  inch, should be made over each fang mark, and preferably one to connect the two fang punctures. The cut must be deep enough,  $\frac{1}{4}$  to  $\frac{1}{2}$  inch, to insure free bleeding. Suction must then be applied for short intervals during at least  $\frac{1}{2}$  hour. This may be applied by the mouth, glass breast pump, or by heating a bottle and applying its mouth tightly over the wound. The cooling of the bottle will produce considerable suction. Snakes' venom is harmless in the mouth unless there are cracks or wounds of the lips or inside of the mouth. The patient should be kept quiet and medical attention obtained as quickly as possible. Anti-venom may be given him, but the free bleeding produced by incision and suction is of far greater value. Whisky is not only useless in the treatment of snake bite but it is distinctly harmful because of its depressing effect. Cauterization of the wound and the use of various drugs, such as potassium permanganate, are also useless.

**227. Insect Bites and Stings.** *a.* The proper removal of the stinger is important. This should be done by grasping the stinger with a pair of small forceps and removing it in its entirety. A paste made of baking soda, or a cold, moist dressing, using a dilute solution of salt, soda, or ammonia, is helpful.

*b.* Poisonous spider and insect bites should be treated in a manner similar to snake bites. A cross incision should be made and a loose tourniquet applied. Cauterization of the wound with a mild acid or with a hot implement is recommended. Shock, if present, should be treated and a medical officer called.

*c.* For the itching of mosquito or chigger bites, calamine lotion is very soothing. For extreme irritation 2 per cent phenol may be added to the lotion. These preparations can be obtained at most dispensaries.

**228. Animal Bites.** The first-aid treatment is the same as that for ordinary wounds. However, medical advice should be sought even if the wound seems trivial, since animal bites are commonly infected, unless dressed properly. If possible, the animal should be captured and examined to be certain that it does not have rabies.

## SECTION IX

### COMMON EMERGENCIES

**229. Poisons.** *a. General.* The two principal points to be remembered in the treatment of poisoning are: (1) Poisons when diluted are not absorbed in as great quantities as when they are in a concentrated form.

(2) The stomach can be cleaned out by causing vomiting or by washing. Washing the stomach with a stomach tube should be attempted only by experienced personnel.

*b. Treatment.* (1) Vomiting is the first step in treatment.

The following fluids are useful in producing vomiting. From four to seven glassfuls should be given, preferably lukewarm. Tickling the throat with the finger will then usually induce vomiting:

- (a) Soap suds from any type of soap.
- (b) Salt water or soda water.
- (c) Lukewarm water.
- (d) 1 tablespoonful of mustard in warm water.

(2) Additional first-aid treatment for specific poisons is as follows:

(a) For carbolic acid (phenol) poisoning, give soap suds or milk.

(b) For the corrosive poisons such as bichloride of mercury, give milk or the whites of eggs.

(c) For iodine poisoning, give starch in water.

(d) For strychnine poisoning, keep the patient quiet and call a medical officer.

(e) For overdoses of sedatives, keep the patient on his feet and make him walk. Give strong coffee and get him to medical attention.

(f) For wood alcohol, shoe dye, or like poisons, induce vomiting and get medical attention.

(g) For acute alcoholism (drunkenness) treatment is usually unsatisfactory and unnecessary. Inducing vomiting and giving strong coffee will speed recovery. Cold baths are dangerous and without value.

**230. Removal of Foreign Bodies.** *a. Foreign bodies in the eye.* (1) Close the eye and allow the tears to accumulate. Do not rub the eye. After a few minutes open it again and the foreign body may be washed out by the tears. If the foreign body is under the lower lid, pull the lid down and have the patient roll the eye up and the foreign body may be easily brushed out by the corner of a clean handkerchief or a small swab made by wrapping a little cotton around the end of a match.

(2) If, as usual, the foreign body lies under the upper lid, grasp the eyelashes of the upper lid with the index finger and thumb of the left hand; place a match or pencil held in the right hand over the middle of the upper lid; then turn the lid over the match and the foreign body may be seen and removed. The corner of a clean handkerchief may be used, or the eye may be irrigated with clean water, using a small sterile syringe.

(3) If the object is embedded in the eyeball or eyelid, close the eye, apply a bandage lightly, and consult a medical officer. Never attempt to use a knife, toothpick, or pin to remove a foreign body.

(4) When acid is splashed into the eye an alkaline preparation made from soda, magnesia, chalk, or lime should be used.

(5) When strong alkalies get into the eye, weak acid solutions such as diluted vinegar or lemon juice are employed.

*b. Foreign bodies in the ear.* The only safe method is to syringe the ear canal with lukewarm water. If the object does not come out, consult a medical officer. Never use pins

or wire to dislodge these objects, as there is great danger of seriously injuring the eardrum. Insects in the ear can usually be killed by dropping in a little oil, and then washing the ear canal with a syringe.

*c. Foreign bodies in the nose.* These usually present no immediate danger. Gentle blowing of the nose may be tried; if unsuccessful, drop in a little olive or mineral oil and consult a medical officer. Any attempt to remove the object with forceps or wire usually causes more swelling and lodges the foreign body more securely.

*d. Foreign bodies in the throat.* (1) As the result of sudden interference with the breathing, the person clutches at his throat and gasps for air. There may be violent coughing or attempts to vomit, the face becomes blue, and the eyes stick out of their sockets.

(2) If another person is at hand, have him go or telephone for the nearest medical officer, notifying him of the nature of the accident so that he may bring the proper appliances. In the meantime attempt to dislodge the foreign body by slapping the back violently between the shoulder blades. If this is not successful, hold the patient by his feet with the head down and have someone slap his back between the shoulder blades.

(3) If a foreign body such as a safety pin or a dental bridge has been swallowed, the patient should be promptly but gently transported to a hospital.

**231. Pain in the Abdomen.** Pain in the abdomen may be due to a variety of causes, many of which may be serious. In any case where there is nausea and vomiting, accompanying or following pain over all or any part of the abdomen and with pain and tenderness in the lower right part of the abdomen, appendicitis should be suspected. Appendicitis may also occur without nausea. Always put suspected cases to bed and call a medical officer. As a general working rule, never give cases with abdominal pain or tenderness food, water, a laxative, or an enema unless ordered by a medical officer.

**232. Unconsciousness.** *a. General.* Unconsciousness may be complete or partial. Frequently it is impossible to determine the cause, and treatment must be along general lines. An unconscious person with an odor of alcohol on his breath should not always be considered drunk. An intoxicated person may not have an alcoholic breath. It is always wise to consider the possibility of apoplexy and skull fracture in every case of unconsciousness. In examining an unconscious patient, look carefully for the cessation of breathing and for symptoms of poisoning, bleeding, or sunstroke, as special treatment for these must be given at once.

*b. Treatment.* Lay the patient on his back with the head and shoulders slightly raised. Apply cold cloths or an ice pack to the head. Insist on absolute quiet; do not move the patient unless urgent and then do so very carefully. Have sufficient cover to keep him warm. Use no stimulants until the patient is awake and some cause for the condition is found. Call a medical officer.

**233. Fainting.** Usually allow the patient to lie where he falls if he can be made comfortable. Lower the head and shoulders by elevating the hips. Loosen the tight clothing. Sprinkling the face with cold water and inhalations of ammonia or smelling salts are beneficial.

**234. Convulsions or Fits.** *a. General.* Convulsions may be due to a variety of causes, among them being epilepsy, hysteria, poisoning of various kinds, and various illnesses. The diagnosis is often difficult. A medical officer should be called promptly. The first aid treatment of convulsions consists essentially in loosening the patient's clothing, avoiding violent restraint, and protecting him from biting his tongue or doing himself bodily injury by threshing about.

*b. Epilepsy.* (1) Epileptic fits may consist merely of momentary unconsciousness with slight muscular twitching, or they may be very serious. In the severe form, with or without premonitory sign, the subject usually utters a peculiar cry and falls into a convulsion. At first the entire body is rigid; then there is generalized jerking of limbs, contortions of the face, and foaming at the mouth. The eyeballs roll upward, and the pupils of the eyes are dilated (enlarged). The patient may bite his tongue and may have involuntary evacuation of his bowels and bladder. After a few minutes the convulsions are followed by profound stupor, and this generally merges into deep sleep. During the attack the patient usually is insensible to pain.

(2) The patient should be placed flat on his back, preferably on a mattress or other soft material, so that he cannot injure himself in tossing about. Force a rolled handkerchief or towel between his teeth to prevent his biting or swallowing his tongue. Do not use any more force than absolutely necessary to keep him from injuring himself. "Epileptic fits" are sometimes feigned. The feigned attack usually occurs at night when no one can see the patient. The man does not fall so as to hurt himself and does not bite his tongue. He flinches when the eyeball is pressed.

**235. Head Injuries.** *a. General.* (1) Comparatively mild blows on the head may cause concussion of the brain. This means actual bruising of the brain itself. This is the condition present when we say a man has been "knocked out" or "stunned." The usual symptoms are unconsciousness, pallor of the face, and quick and shallow breathing. The pupils of the eyes are of equal size and are usually small. The degree of insensibility varies. Sometimes the patient can be aroused but is irritable and lapses again into unconsciousness. The duration of symptoms is dependent largely on the severity of the injury.

(2) More severe blows or falls on the head may cause fracture of the skull, hemorrhage within the skull, or compression of the brain. In these more severe injuries the patient cannot be roused. There may be bleeding from the nose or ears. The breathing is deep and snoring. There may be paralysis of part of the body.

*b. Treatment.* It is often impossible to determine the severity of head injuries early. Therefore extreme caution

should be observed. The patient should be laid flat, with the head slightly raised. He should be kept warm. No violent efforts to rouse him should be made. Shaking his head or slapping his face and neck are very dangerous procedures, since they may increase the injury. A medical officer should be called promptly. No stimulants should be given by mouth, but in the milder injuries aromatic spirits of ammonia may be inhaled with benefit.

**236. Apoplexy.** Apoplexy is a condition due to sudden rupture or blocking of one or more blood vessels within the brain. It is most common in persons past 50 years of age, but may be seen in younger persons. The onset is sudden. Consciousness is usually lost. The face is flushed, one or both pupils dilated, the breathing is abnormal, and the cheeks puff out with each expiration. There is usually paralysis of one side of the body; this may be determined by lifting up the hands and legs and allowing them to fall slowly to the side. The one that is paralyzed will be cold and lifeless and will drop like a dead weight. The first-aid treatment is essentially the same as that for head injuries, rest and quiet.

## SECTION X

### TRANSPORTATION OF WOUNDED <sup>1</sup>

**237. Transportation With Litters.** *a. Service litter.* The service litter is the most satisfactory means of transporting patients over difficult terrain. It may be carried by two or four men, or may be attached to a wheeled field carrier.

*b. Improvised litters.* Many objects and materials may be used to construct improvised litters:

(1) Camp cots, window shutters, doors, benches, and ladders, properly padded.

(2) Litters may be made with sacks, bags, or bedticks, by ripping the bottoms or snipping off the corners, passing two poles through them and tying crosspieces to the poles to keep them apart.

(3) A shelter half, a blanket, a piece of matting, or carpet may be fastened to poles by tacks or twine.

(4) Hay, straw, or leafy twigs over a framework of poles and cross sticks make an efficient litter.

(5) Rope, wire, or rawhide may be woven between poles and this network covered with a blanket.

(6) The usual military improvisation is with blankets or shelter tents, and poles about 7 feet long. The blanket is spread on the ground. One pole is laid across the center of the blanket which is then folded over it. The second pole is placed across the center of the new fold and the blanket is folded over the second pole as over the first and the free end of the blanket fixed.

(7) A litter also may be prepared by turning two or three blouses inside out and buttoning them up, sleeves in.

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<sup>1</sup> For complete information on transportation of the sick and wounded, see FM 8-35.



Figure 102. Service Litter.

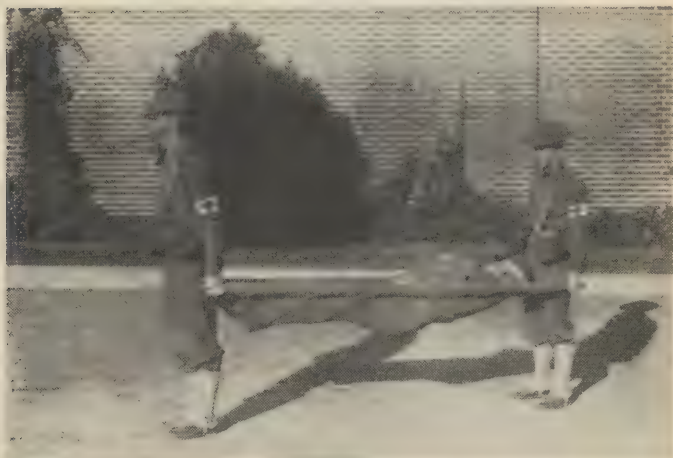


Figure 103. Litter Improvised With Blankets.

then passing poles through the sleeves, the backs of the blouses forming the bed.

**238. Methods of Removing Wounded Without Litter.** *a. Rifle coat seat.* A good seat may be made by running the barrel of a rifle through each sleeve of an overcoat, turned inside out and buttoned up, sleeves inside, so that the coat is back up, collar to the rear. The front bearer rolls the tail of the coat tightly around the barrels and takes his grasp over them; the rear bearer holds the rifles by the butts, trigger guards up.



Figure 104. Rifle Coat Seat.

*b. Rifle blanket seat.* First a blanket is folded once from side to side, and a rifle laid transversely upon it across its center so that the butt and muzzle project beyond the edges. Next one end of the blanket is folded upon the other end and a second rifle laid upon the new center in the same manner as before. The free end of the blanket is then folded upon the end containing the first rifle so as to project a couple of inches beyond the first rifle. The seat so formed is raised from the ground with trigger guards up.

*c. One bearer.* A single bearer may support a slightly injured man, or carry a patient in his arms, or on his back,

or across his shoulders. If the patient is helpless, the last method is best. This is effected as follows:

(1) The bearer, turning the patient on his face, steps astride his body, facing toward the patient's head and, with hands under his armpits, lifts him to his knees. Then, clasping hands over the abdomen, he lifts the patient to his feet. Next he seizes the right wrist of the patient with his left



Figure 105. Patient Carried on Back.

hand and draws the arm over his own head and down upon his left shoulder. He now shifts himself in front of the patient, stoops, and passes his right arm between the legs and grasps the patient's right wrist. Lastly, with his left hand he grasps the patient's left hand and steadies it against his side as he rises.

(2) In lowering the patient, the motions are reversed. Should the patient be wounded in such a manner as to require these motions to be conducted from the right side instead of the left, as described, the change of method is simply one of hands, the motions occurring as directed, substituting right for left and vice versa.

*d. Two bearers.* The bearers take their positions with one man between the patient's legs and the other at his head,

both facing toward his feet. The rear bearer, having raised the patient to a sitting posture, clasps him from behind around the body under the arms; the front bearer passes his hands from the outside under the flexed knees; then both raise the patient to the carrying position. This method requires no effort on the part of the patient. It should not be used in severe injuries of the extremities.



Figure 106. Patient Carried in Arms.

*e. Horseback.* (1) The assistance required to place a disabled man on a mount will depend upon the site and nature of his injury; in many cases he will be able to help himself materially. The horse, blindfolded if necessary, is held by an attendant.

(2) Once mounted, the patient should be made as safe and comfortable as possible. A comrade may be mounted behind him to guide the horse. A lean-back may be provided, made of a blanket roll, a pillow, or a bag filled with leaves or grass. If the patient is very weak, the lean-back may be made of a sapling bent into an arch over the cantle of the saddle, with its ends securely fastened thereto.



**Figure 107. Patient Carried Across Shoulders.**

## ORGANIZATION AND ADMINISTRATION OF AN ARMY HOSPITAL

**239. Military Hospital Defined.** A military hospital is an institution provided by the government for the treatment of military personnel while they are sick or injured. Army hospitals are established primarily for the care of Army personnel.

**240. Military Hospitals in War.** In time of war, *mobile* hospitals form a constituent part of the mobile forces. These hospitals are established in the combat zone and comprise evacuation hospitals, surgical hospitals, convalescent hospitals, and the clearing stations (emergency and in camp) operated by the clearing companies of medical regiments, medical battalions, or medical squadrons. These field medical installations are discussed in Chapter 22.

The *fixed* or non-mobile military hospitals are identical in time of war or peace and serve the same general purposes. They are established in the zone of the interior and in the communications zone. Whenever practicable three or more general hospitals may be grouped at one place into an administrative and clinical organization known as a "hospital center." A convalescent camp constitutes a part of the hospital center. The administration of these fixed hospitals is similar to that of the fixed hospitals of peace time.

**241. Military Hospitals in Peace.** Military hospitals in time of peace are of two general types: station hospitals and general hospitals.

*Station hospitals.* These hospitals are provided for the hospitalization of the sick and wounded of local commands. They function under local commanders. For example, the station hospital at Fort Sheridan is conducted by the surgeon at Fort Sheridan, who functions under the commanding officer, Fort Sheridan. Station hospitals ordinarily have facilities to hospitalize 5 per cent or more of the local command.

*General and department hospitals.* These hospitals are provided for the hospitalization of the sick and wounded of larger areas and for the care of special cases for which the authorized facilities of general hospitals are more adequate. During peace time the general hospitals function under the immediate direction of the Surgeon General. The department hospitals in Honolulu and Manila serve the same purposes as general hospitals but are under local departmental control.

The permanent general and department hospitals of the Army are:

- Army and Navy General Hospital, Hot Springs, Arkansas.
- Fitzsimons General Hospital, Denver, Colorado.
- Letterman General Hospital, San Francisco, California.
- Sternberg General Hospital, Manila, Philippine Islands.
- Tripler General Hospital, Honolulu, Hawaii.
- Walter Reed General Hospital, Washington, District of Columbia.
- William Beaumont General Hospital, El Paso, Texas.

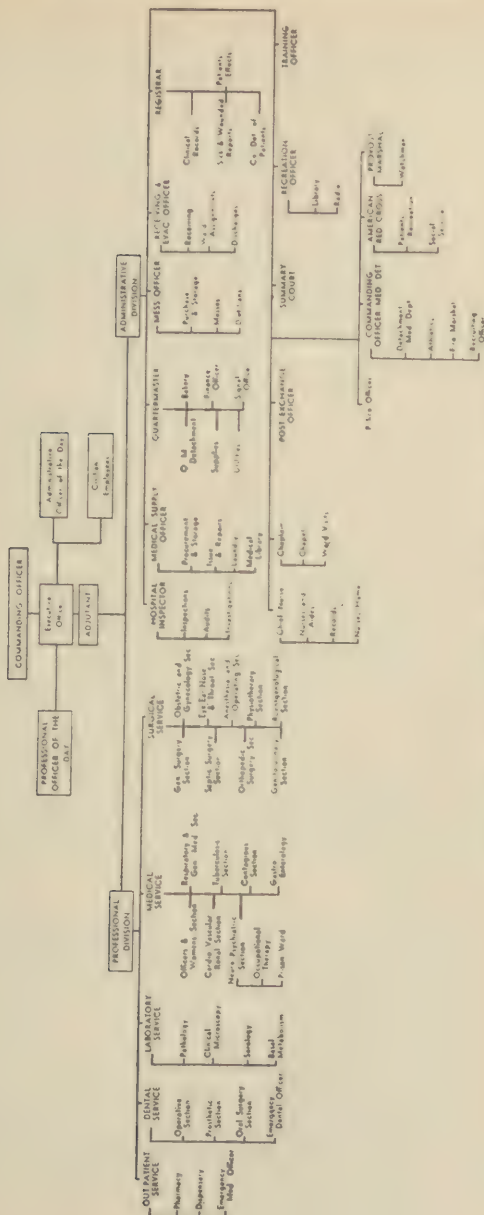


Figure 108. Organization of an Army Hospital.

**242. Army Dispensaries.** In order to provide medical attention for groups of military personnel not located at Army stations, or where there is an excessive amount of out-patient clinic service, general dispensaries staffed with Medical Department officers and enlisted men are established at these centers of military activity. At large posts a dispensary is established, in addition to the station hospital, to facilitate the out-patient service. Sick call and physical examinations are held there.

*Sick call.* Sick call is a military formation held daily at an hour designated by the commanding officer. At this time all sick or injured are conducted by a noncommissioned officer to the surgeon at the hospital, dispensary, or other place for holding sick call to determine whether they can continue their regular duties or whether they should be admitted to hospital or quarters. Those able to do "duty" are so marked on the daily sick report, given the necessary treatment, and returned to their organization. Should further treatment be required they will return to sick call daily until informed otherwise by the surgeon. Those requiring hospitalization for more adequate treatment are sent to the hospital after sick call. In case of emergency, sick or injured may be admitted to the hospital at any hour. However, the unit commander should be informed as soon as practicable so that the soldier's name and proper notations can be made on the company sick report.

**243. Hospital Regulations.** In so far as is practicable, the provisions of Army Regulations 40-590 govern the administration of Army hospitals established for the care and treatment of personnel. In general, they cover chiefly the administration of general hospitals and the larger station hospitals, but in so far as applicable and practicable they govern the administration of all fixed hospitals regardless of their type of capacity. See Army Regulations 40-245, 40-580, 40-600, 40-605, and 40-610. For records and reports, see Chapter 24.

**244. Hospital Organization.** The hospital is organized so as to provide the best professional care of the sick and injured. The general organization of the hospital is in general conformity with Army Regulations 40-590. The organization consists of two major divisions: administrative and professional (fig. 108).

*The administrative division.* The administrative division of a fixed hospital includes such personnel and activities as the commanding officer of the hospital may prescribe for the efficient administration of the hospital. The personnel and activities which belong to the administrative division are shown in fig. 108. In smaller hospitals several activities may be placed in charge of one officer.

*Professional division.* For convenience of administration, and in the interest of professional efficiency, the commanding officer of each Army hospital organizes the professional activities of his hospital into services after the manner of well-organized hospitals in civil communities. He prescribes the number of services for his hospital, the lines of control over them, and their relationship to each other. The usual services are shown in fig. 108.

**245. Titles of Medical Personnel.** The following nomenclature is observed in designating the official position of Medical Department personnel performing the more important administrative and clinical duties at a hospital:

Duty	Title
Commanding hospital .....	Commanding Officer.
In charge of a service .....	Chief of .....Service.
Commissioned assistant on a service ..	Assistant .....Service.
Officer in charge of records of sick and wounded .....	Registrar.
Officer in charge of a ward .....	Ward officer.
Commissioned assistant in a ward ....	Assistant ward officer.
Nurse in charge of a ward .....	Head nurse.
Principal enlisted assistant in a ward..	Ward master.
Other enlisted assistant in a ward ..	Ward attendant.

**246. Commanding Officer of the Hospital.** The senior medical officer of the hospital staff is the commanding officer of the hospital. He is known as the "station surgeon" if the hospital is located at an Army station. This distinguishes him from the commanding officer of the post. The surgeon is responsible for the proper administration of the hospital, which includes the care and treatment of patients and the rendering of all necessary reports connected therewith.

**247. Medical Officer of the Day.** A medical officer of the day is detailed daily by roster to serve for 24 hours. His functions are both administrative and professional, although in large hospitals the duties may be apportioned among several individuals. During his period of duty he holds himself available for emergency professional service, particularly during hours when other medical officers are off duty. He is in charge of the hospital at night, makes inspections at stated intervals, inspects the mess at each meal, and represents the commanding officer of the hospital in the latter's absence.

**248. The Commanding Officer of the Medical Detachment.** The commanding officer of the hospital or one of his commissioned assistants commands the enlisted personnel as "detachment commander." He has essentially the same duties as the commander of a company. He assigns the enlisted personnel to appropriate duties and prescribes and enforces regulations as to the sanitary, disciplinary, and other requirements.

**249. Hospital Rules. (Paragraph 22, AR 40-590.)** The commanding officer of the hospital is responsible for the formulation and enforcement of such hospital rules as are necessary for the guidance of patients and duty personnel. Rules should be kept posted in appropriate places so as to be easily seen and read by those persons to whom they are applicable. The rules below have in the past been instrumental in promoting the administrative efficiency and are published herein as a guide for drawing up detailed rules for a hospital.

Each officer in charge of public property will keep an accurate account of the same and of its place of distribution.

Each person in charge of a department of the hospital is responsible for the public property in his department. The responsible person will keep a list of property and will assure himself of its presence by frequent inventories (at least once a month).

All public property in the possession of enlisted men must be kept in good order and missing or damaged articles accounted for.

A person, upon his assignment to a department of the hospital, will become familiar with the special orders and rules governing it, and all must familiarize themselves with the standing orders of the hospital.

All noncommissioned officers and privates of the detachment will be present at all formations unless specially excused.

All men on duty in the kitchen and mess hall will arise at least one hour before reveille; all other members of the detachment, unless specially excused, will arise at or before first call for reveille.

Immediately after reveille each man will arrange his bed and personal belongings in a neat and orderly manner. All clean underclothing will be uniformly packed in his locker; other clothing will be brushed and hung in the lockers or in a designated place. Soiled clothing will be kept in the barrack bags. Shoes will be polished and neatly arranged in the lockers or under the sides of the beds.

All beds will be overhauled and cleaned each week, and, weather permitting, the bedding and mattresses will be well shaken and hung out to air for at least two hours each week. Mattress covers will be changed immediately before each monthly inspection and oftener if necessary. Sheets and pillowcases will be changed at least once each week.

A card bearing the name of the soldier will be attached to the foot of his bed, and his accouterments will be hung, neatly and uniformly arranged, on the foot end-iron of his bunk.

The squad room will always be kept clean, neat, and orderly.

The men will pay the utmost attention to personal cleanliness; each man will bathe at least once weekly, his hair must be kept short, face shaved, and underclothing frequently changed.

Members of the detachment will wear the prescribed uniform at all times when present at the station. While on fatigue they may wear the fatigue clothing. While on duty in wards, pharmacy, operating room, mess room, or kitchen they will wear the white uniform.

No member of the detachment will leave the hospital bounds except by permission of proper authority or in case of emergency in the execution of duty.

Immediately after breakfast the hospital will be thoroughly policed in every department. It must be ready for inspection at the hour designated by the commanding officer and always kept scrupulously clean.

No member of the hospital personnel will borrow money or have financial dealing with any patient.

A noncommissioned officer in charge of quarters will be detailed by roster from noncommissioned officers on duty with the detachment; an emergency squad will always be designated.

The noncommissioned officer in charge of quarters will make an inspection of all wards and quarters at such times as the commanding officer of the hospital may direct; he will report all unauthorized absentees to the noncommissioned officer in charge of the detachment and will see that no unauthorized lights are burning. In case of fire he will give the alarm and proceed as ordered in fire regulations. He will be responsible for the efficient performance of duty by the guards.

The guards (sometimes called "emergency detail") will be under the immediate orders of the noncommissioned officer in charge of quarters. The guard on duty will patrol the hospital grounds at least once every three hours and will be constantly on the alert for fire, unauthorized lights, and unauthorized persons in or about the hospital. The guard will report at once to the noncommissioned officer in charge of quarters all unusual occurrences and violations of existing orders which come under his observation.

**250. The Registrar.** In the military service the office of registrar is peculiar to the Medical Department. The registrar has charge of all medical and surgical records and sees that careful and accurate clinical histories, statistical tables and charts, and all prescribed sick and wounded records are kept. He prepares all reports and returns pertaining to the sick and wounded. If the commanding officer does not as-

sume direct command, he commands the detachment of patients and has charge of all records, accounts, and returns pertaining thereto. He is custodian of the money and valuables of patients in the hospital. He performs such other duties as may be prescribed by proper authority.

**251. The Clinical Record (Form 55a, M.D., and Accompanying Lettered Forms).** The Clinical record when completed is a complete history of the patient during his stay in the hospital. Therefore it is essential that all important data and information be entered on the appropriate lettered forms. A clinical record of each patient is kept at all times at fixed hospitals excepting those which are located in a theater of operations.

The clinical record of each patient is started as soon as practicable after admission, using such lettered forms of M.D. Form 55 as the importance and nature of the case demands. They should show an accurate, concise record of the patient's previous history, condition on admission, daily treatment and condition while in the hospital, and his condition upon discharge from the hospital. Upon the transfer of a patient from one ward of the hospital to another, the clinical record is sent with him to the new ward, the fact of transfer being noted thereon. Upon the departure of a patient from the hospital, all of the sheets of the clinical record will be arranged in their proper order, all entries completed, fastened together at the top, and signed by the ward officer. It is then sent to the registrar's office with the next morning report of the ward. The clinical records of all completed cases are immediately filed in the sequence of the registration number which is the number given to the patient's clinical record upon admittance and placed on his register index card (Form 52a, M.D.) upon discharge. The index cards are filed in alphabetical order according to the surnames of the patients. If the patient re-enters the hospital the new register number will be entered on the same index card. For further information regarding records of sick and wounded, consult AR 40-1025, AR 40-1030, AR 40-1040, AR 40-1045, AR 40-1050, AR 40-1055, AR 40-1060, AR 40-1065, and AR 40-1075.

**252. Procedure in Admitting Patients to an Army Hospital.** Admitting a patient to an Army hospital includes specific measures so as to secure correct identity of the patient, proper care of his valuables and personal belongings, and completion of the necessary records pertaining thereto. Patients who are seriously sick are not held for examination or preparation of routine records but are admitted directly to the correct ward. For such cases an attendant should accompany the patient and obtain the necessary data at the ward for the preparation of Form 55a, M.D.

*Identification.* Each patient must be inspected upon arrival at the hospital and every effort made to establish his unquestioned identity by name, rank, or grade, serial number, and military organization. Except in emergency no civilians are admitted to the hospital except those entitled to treatment without specific authority from the commanding officer or surgeon.

*Admission records.* The most important admission record is the initiation of clinical record Form 55a, M.D., which will

include the status of military and civilian patients and which will be sent to the ward with the patient. Notation is made of any unusual circumstances connected with the admission of the patient. Also, at the time of admission the patient's clothing and property record must be completed.

**253. Patient's Personal Belongings.** When a patient is admitted he must be advised to deposit his money and other valuables with the "registrar" for safekeeping. If he elects to take them to the ward he does so at his own risk.

*Money and valuables.* A triplicate list of money and valuables deposited is signed by the patient and the admitting officer. The triplicate copy is given to the patient as his receipt. The original and duplicate are delivered to the "registrar," who signs the duplicate and returns it to the admitting officer as his receipt. If the patient is unconscious he is searched by the admitting officer. When money or valuables are found they must be listed and deposited with the "registrar."

*Patients' clothing and property.* Patients' clothing and property are delivered to the baggage room and the receipt countersigned by the attendant in charge. Patients are to be informed that the contents of grips, trunks, and other baggage must be listed; otherwise, the surgeon will not assume responsibility for any loss. When received, articles of patients' effects will be carefully labeled with the name, rank, and organization of the owner, and their contents noted. These data are entered on a *property record card* (Form 75. M.D.) for the property of each person. The duplicate card is given to the owner of the property as a receipt, and the original retained in the "live file." The clothing worn by patients at the time of their admission and their hand baggage will be kept in the room for patients' effects.

*Patients going on pass.* A patient who has been authorized to leave the hospital on pass presents his card and an order from the ward officer for his clothing to the attendant on duty in the patients' clothing room. The patient must be accompanied to the clothing room by a ward attendant. The retained card, receipted by the patient, is held (suspended) until he returns.

*Upon disposition of patients.* When a patient returns to duty, is furloughed, or is discharged from the service and leaves the hospital, his effects are restored to him. The patient, accompanied by the ward master, presents his property receipt card to the attendant in charge of the "patients' effects room" together with an order (certifies discharge) for his clothing signed by the ward officer. The patient signs an acknowledgement that his clothing and effects have been returned on the retained card which is then returned to the file. When a patient dies or deserts, his effects will be disposed of as indicated in AR 600-550 and 615-300, respectively. When a patient is to be transferred to another hospital his effects will be restored to and receipted for by him if he is able to take care of them. When he is unable to take care of them they will be intrusted to the senior officer or enlisted man in whose charge the patient is being transferred. He in turn will secure a receipt for the patient's effects from the proper authorities of the receiving hospital.

## WARD MANAGEMENT

**254. Ward Defined.** A ward is a large hospital room prepared for the care and comfort of a number of patients. The furnishings of a hospital ward are usually plain, substantial, durable, free from decorations, and smooth so they can be easily cleaned with soap and water. The color of the walls and floors is plain, free from patterns, and cool and restful to the patients' eyes. Everything is so planned that simplicity and neatness are the keynote which will help to impress the patients that it is a place of perfect order, giving them a feeling of confidence. Most of the wards in an Army hospital are built similarly. The ward offices, lavatory, utility room, linen room, and ward kitchen are usually connected to the ward and are conveniently arranged to facilitate the ward work.

**255. Ward Management Defined.** Ward management is the term applied to the control of all activities which should properly take place within the hospital ward. It includes supervision of nursing care of the patients; the cleaning and policing of the ward and adjacent rooms; completing all orders and treatments prescribed for the patients therein; completion of all records pertaining to patients; preservation of instruments, equipment, and property charged to the ward; provision of adequate supplies and economy in their use; and giving instruction to those employed in the ward.

**256. Responsibility for Ward Management.** In Army hospitals the ward surgeon has direct supervision over the ward. The head nurse or ward master in charge of the ward is responsible for the care and nursing of the patients and the management of the ward as stated in the paragraph above. In their absence the senior enlisted man assumes charge of the ward.

**257. Ward Personnel.** The assignment of personnel to a ward of about 20 patients normally includes a ward surgeon, a head nurse or a ward master, and enlisted attendants (assistant nurses) as required.

The ward surgeon may have other duties extending beyond the particular ward, and in his absence the nurse or ward master takes charge of the ward. He accompanies the ward surgeon on his rounds, making notes as to the orders for each patient and such other directions as the ward surgeon may give so that later he may execute these orders or have them carried out by others. One nurse is ordinarily sufficient for a ward of 20 patients, providing all attendants are capable assistants.

The ward master or nurse should assign specific duties to the enlisted assistants based upon a well-arranged schedule of the ward work; this includes the police of the ward and the nursing or bedside care of patients. He should assign the more responsible duties to the attendants having the most experience and the simplest duties to those having the least experience. However, to help the new attendants attain proficiency the ward master should have them assist the more

experienced men in the care of the sick. Contact with the sick person deepens the sense of responsibility and helps attendants to develop a serious attitude toward their work.

It is desirable that the duties be so divided that one attendant regularly looks after the same patients; the latter should be grouped together in order to save time and increase convenience. The schedule should provide a fair and equal distribution of work in accordance with the number or persons assigned for duty in the ward. This policy reduces chance for friction and greatly helps to maintain the spirit of cooperation so necessary between the medical officer, the nurse or ward master, the enlisted assistants, and the patients. Such considerations in duty assignments will help to obtain a cheerful atmosphere and efficient operation of the ward.

**258. Ward Rules.** Ward rules which apply to all ward personnel are as follows (AR 40-590):

The head nurse (in wards in which Army nurses are not assigned, the ward master) of each ward is directly responsible to the ward officer. This person is in charge of the ward and the enlisted assistants and patients within it and will be obeyed and respected accordingly.

The head nurse (in wards in which Army nurses are not assigned, the ward master) is responsible for the cleanliness and order of the ward, for the public property therein, and for the effects of the patients until they have been turned over to the proper custodian, and is responsible for the prompt delivery of prescriptions to the pharmacy, of medicines to the ward, and of the diet cards to the mess office.

In wards to which Army nurses are not assigned, the ward master is responsible for the administration of medicines and other treatment prescribed, the keeping of records, and all other duties that may be assigned to him by the ward officer. No enlisted men, except those authorized in writing by the responsible medical officer to do so, will administer medicine to a patient in hospital and then only as directed by the responsible medical officer and under such limitations as his written authorization prescribes.

Phenol, bichloride of mercury, other active poisons, alcohol, and alcoholic liquors, when necessarily on hand in the ward, will be kept under lock and key and every precaution taken to prevent their improper use. Disinfectants such as formalin, cresol, etc., and medicines for external use only, will not be kept on the same shelf or in the same medicine cabinet as medicines for internal administration.

On the death of a patient the ward master will notify the ward officer or in his absence the medical officer of the day. He will not remove the body from the ward until after it has been examined by a medical officer.

The ward master will see that patients are acquainted with ward rules. The rules should be read and explained to them.

Before leaving the ward at the end of his daily tour of duty, the ward master will turn over to his relief all orders of the ward officer, accompanied by such explanation and instruction as may be necessary.

Upon reaching the ward, patients will be promptly bathed, clothed in clean hospital clothing, and put to bed, unless their condition indicates otherwise or a specific order forbids.

Money and valuables found on patients will be turned over to the commissioned officer who is custodian of such articles. Patients will be given receipts for their articles. Upon presentation of the receipt on discharge from the hospital, the patient's effects will be restored to him. The commanding officer is not responsible for money or valuables of patients not turned over for deposit in the hospital safe.

A clinical record (Form 55a and accompanying lettered forms) will be carefully kept for each patient. Upon final disposition of the case this record will be completed and signed by the ward officer and turned in to the record office.

No information regarding the diseases or conditions of patients under treatment will be given to anyone except those authorized under the regulations to receive it.

Visitors will be allowed to see friends in the ward at a specified time, when their presence will in no way disturb other patients.

Bed linen will be changed on occupied beds at least twice weekly and oftener if necessary to insure cleanliness. Whenever a bed is to be occupied by a new patient, clean linen will be furnished. All bedding and clothing used by infectious cases will be promptly disinfected when removed from the beds. Patients will not occupy their beds when dressed in other than hospital clothing.

Loud noises, boisterous actions, the use of profane language and gambling are forbidden in the wards, and no food, intoxicants, or other articles of food or drink, except as prescribed or authorized, will be brought into the wards.

Patients are forbidden to use towels, basins, toilet articles, eating utensils, or articles of clothing pertaining to another patient.

**259. Instructions for Patients.** The head nurse or the ward master is responsible that each patient understands the ward rules as stated in par. 258. The bed patients should have the ward rules read or explained to them as soon after their arrival as their condition will permit. Walking patients should be shown where the ward rules are posted and be instructed to read them carefully. In addition to the ward rules there are other instructions which the patient should be given. These include: that no food, intoxicants, narcotic drugs, or other articles of drink will be brought or used in the ward; that bed patients will be served their meals on a bed tray; that if they mess in the main mess hall they will remain in the ward until notified the meal is ready to be served; that they must remain in the ward unless authorized to leave same by the ward officer and, if permitted to do so, they must report to the head nurse or ward master upon departure and return; that their personal mail will be delivered to them daily by the ward master; that when they are able they will be required to keep their own bed and surroundings clean and orderly at all times; that any violations of the ward rules are punishable by disciplinary action in the case of enlisted men or, in the case of civilians, by dismissal from the hospital; and that all complaints should be made in person to the head nurse or ward master, who will bring them to the attention of the ward officer.

**260. Ward Records.** The commonly used ward records are: the patient's clinical record (Form 55a, M.D., and accompanying lettered forms); diet cards (Form 73, M.D.); the treatment book; and the temperature book. All will be made out in ink in so far as practicable and kept up to date. Except for the diet cards they are preserved as a permanent record of the ward. When no longer needed they are sent to the registrar for file.

The clinical record is the complete story of the patient while in the hospital, and all treatments, medicines, and records or events pertaining to his condition are recorded therein. In case patients are sent to appear before boards or to other departments of the hospital for examination or treatment, the clinical record is sent to the officer concerned. Under no condition are patients to be allowed to handle clinical records or other ward records. In the case of transfer of a patient from one ward to another his clinical record is completed to

date, noting the exact time of transfer, the ward to which transferred, and the condition of the patient. The clinical record accompanies the patient and his attendant to the ward to which he is transferred. The day preceding the departure of the patient to duty status the clinical record is completed, arranged in proper sequence, fastened together, signed by the ward officer, and delivered to the sick and wounded office (record office).

A diet card covering the requirements of the ward patients for the next 24 hours is completed and sent to the mess office in sufficient time for the preparation of the day's meals. Additional cards for newly-admitted patients or newly-arrived personnel are made out when necessary. The diet cards are destroyed after they have served their purpose.

The *treatment book* is a record used by the ward officer for writing his orders for each patient. All orders for treatment should be in writing and should be signed by the ward officer. The treatment book is kept in the ward office at all times.

The *temperature book* is a record in which the temperature, pulse rate, and respiration rate of patients are listed. These recordings are transferred to the respective patient's clinical records.

Other records of the ward are dependent on the local regulations of the hospital as to form and method of use. Such records may include pass books, transfer cards, ward reports, list of ward patients, roster of ward personnel and their assignment of duties, and property records.

**261. Ward Office.** The ward office is the administrative center of the ward. It is usually a small room situated adjacent to the ward. It contains the ward officer's desk, the desk for the head nurse or ward master, the ward medicine cabinet, and the files for ward records. Only those specifically required by their duties should be allowed to enter the ward office. Except when interviewed by the medical officer or the head nurse, patients are not permitted in the ward office.

**262. Ward Property and Linen.** Constant attention must be given to preserve in good condition all instruments, equipment, linen, or other property in the ward. Those in charge should see that it is not abused and that necessary repairs are made promptly. A record of the property with which the ward is charged should be kept and the property inventoried at least once a month to determine if there has been a loss. Property will not be transferred without prior approval of the commanding officer.

Linen should receive special attention, and an inventory should be taken weekly. Soiled linen should be counted before going to the linen exchange room and the clean linen counted before leaving the linen exchange room. Linen closets should be kept locked, and the nurse or ward master should carry the keys. Damages to linen should be avoided by the use of protective pads, rubber sheeting, and by care in giving and removing bed pans and urinals. For cases requiring treatment which will stain, such as genito-urinary cases, burns, scabies, etc., old, repaired linen should be used.

There should be a designated time for the issue of clean linen in wards. Patients who are able to be up and about should be required to bring their soiled linen to the linen closet to be exchanged for clean linen.

**263. Ward Utility Room or Closet.** The utility room or closet contains the brooms, mops, dust cloths, rags, and other cleaning material for the police of the ward; shelves and hooks for the storing of these articles; the bed pan sterilizer; the rack for bed pans and urinals; and a sink with hot and cold running water for cleaning these articles. All articles removed from the utility room or closet should be returned promptly when no longer needed, cleaned thoroughly, and replaced in their proper storage place. The utility closet should be scrubbed and policed at least twice daily.

**264. Police of the Ward.** It is important that the ward be kept clean because dust and dirt favor the growth of bacteria. This cleaning should disturb the comfort of the patients as little as possible and must not interfere with their care and treatment. The work should be equally distributed so that each ward attendant will know exactly the cleaning duties required of him. Patients who are able to work may be assigned to help.

In addition to the daily routine cleaning, plans should be made so that each day of the week some special cleaning, such as walls, windows, woodwork, beds, and furniture, will be attended to.

Dusting should be done daily and systematically. Use a damp cloth, rinsing it frequently in clean, warm water.

Floors should be swept frequently, at least three times daily. Unpolished floors must be scrubbed with brush, hot water, and soap as often as necessary. Change the water frequently when scrubbing, as dirty water will not clean the floor and will leave the surface streaked.

Metal should be cleaned with a suitable metal polish. Porcelain tubs and sinks should be scoured with special cleansing materials and then rinsed with hot water.

Bedpans, urinals, irrigating cans, and other similar utensils must be kept clean at all times. Rubber articles and sheets should be cleaned with warm water and soap, rinsed well, wiped with a disinfectant solution, and hung in a cool place to dry.

Dishes and silverware should be thoroughly washed and sterilized after use. Special attention should be given to dishes used by a patient having a contagious disease. Wash these dishes separately and keep them separated from dishes used by other patients.

Refrigerators and coolers should be cleaned with hot water and soap before the arrival of the ice and fresh supplies. Shelves should be removed and cleaned separately. The water cooler should be taken apart when cleaned.

Tables and dish cabinets should be scrubbed and aired daily. Do not use paper shelving as it provides a hiding place for roaches and for the collection of food crumbs.

Cleaning equipment and materials should be returned to their proper place in the utility closet or room as soon as

work is completed. They should be washed with soap and water frequently and then aired in the sun. Be careful when using lye as a cleaning material as it may produce severe burns to the hands. Be sure it is well and clearly labeled. Dissolve lye in water before applying it to an area to be cleaned.

Prior to an inspection, make a complete check of the ward cleanliness. As the inspector proceeds, open all drawers, cabinets, medicine closets, and lockers, closing them immediately after they have been examined.

Police of the ward includes an orderly arrangement of the furnishings of the ward. All articles of furniture should be arranged uniformly so that beds, tables, chairs, and stands are in straight lines, if practicable. Keep each article in its proper place. Do not permit the patients to accumulate articles on their beds, chairs, and tables or to tuck them under pillows or on the window sills and radiators. Ward attendants must be constantly on the alert to keep the ward in perfect order.

**265. Ventilation, Heating, and Lighting.** General care of the ward includes the maintenance of the correct standard of ventilation, heating, and lighting. Most hospitals are constructed with the necessary provisions for the correct adjustment of all three.

Proper ventilation is provided by the inlet of pure air without causing a draft. When windows are opened they should all be raised or lowered a uniform distance. Exposure of the patients should be avoided by having them sufficiently covered when the windows are opened for the purpose of airing the ward.

The average ward temperature should be 68 degrees Fahrenheit during the day and 65 degrees Fahrenheit during the night. Treatment and bath rooms should be kept at 72 degrees Fahrenheit. Patients with chronic diseases, poor circulation, or anemia, or those who have just returned from surgery under general anesthesia, require a warmer temperature than other patients. Ward attendants should check the room temperature by looking at the ward thermometer occasionally.

The effect of sunlight in a ward is beneficial as the direct rays of the sun are the best air purifiers and germ destroyers. A ward should have as much sunlight as possible. Artificial lighting should be by indirect means; when this method is not used, shades and screens may be employed or the position of the patient's bed changed to protect his eyes from glaring lights.

**266. Daily Ward Duties.** In the morning before breakfast the night attendant should see that all patients have their faces and hands washed, their mouths cleansed, their teeth brushed. He should take the temperature, pulse, and respiration of all patients and record them in the temperature book. Before he goes off duty all medicines and treatment ordered to be given before breakfast should be completed; all specimens for laboratory examination should be collected and taken or sent to the laboratory; and all necessary pre-operative routine for surgical patients completed.

The day attendants serve breakfast. They feed patients too sick to feed themselves or secure the assistance of other patients who can aid them. Breakfast dishes are collected and returned to the kitchen as promptly as possible so as not to delay the day's routine work.

After breakfast the beds are made up, bed-baths given, the ward aired, swept, and dusted, the furnishings arranged, and everything made ready for the ward officer's inspection and morning rounds.

The head nurse or ward master, on arrival in the morning, should visit all patients and become thoroughly acquainted with the condition of each, especially those who are seriously or critically ill. Records should be brought up to date, laboratory reports attached, and made ready for the ward officer and the chief of the service. The morning report of patients will be completed and submitted to the registrar, after the roster of patients has been checked to see that all patients are in the ward. Requisitions for ward supplies will be prepared and submitted to the proper authorities. Mail for the patients is distributed. Attention will be given to dressings, medicines, temperatures, and diets between 10 A.M. and the serving of the noon meal.

After dinner the patients are allowed to rest while the attendants keep the ward policed and carry on the necessary work of the ward. When visiting hours are over visitors who have not departed will be told politely that it is time for them to leave the ward.

The patients are then prepared for the evening meal. About one hour after the evening meal the evening toilet of patients begins. Medicines and treatments as ordered are given, and the ward records are brought up to date. The wards and adjacent rooms are policed and left in a clean condition. Sufficient supplies of medicines, dressings, ice, and food are secured for the routine night care and for the special diets for breakfast.

Later in the evening, after visiting hours, bed patients are prepared for sleep. The bed clothes are straightened, brushed free of crumbs, and bed patients given their alcohol back-rubs. All patients are checked to see that they have the things they need throughout the night; absentees are reported to the medical officer of the day; and all ward lights, except night lights, are turned out at the required time set by the hospital rules.

During the night special vigilance is given to the seriously and critically ill. They should be located near the ward office so as not to disturb other patients while attending them. Routine night medicines and treatments are given as ordered. Medicines, treatment, and the condition of the patients during the night will be recorded. All unusual occurrences are reported promptly to the medical officer of the day. At 6 o'clock the morning cycle of duties begins again.

**267. Admission of the Patient to the Ward.** The actual nursing care of a patient begins on his admission to the ward. He should receive immediate attention, be greeted with an air of friendliness, and action taken to make him feel comfortable and at ease with his new surroundings.

If he is a walking patient he should be assigned a bed at once, the admitting records completed, and the routine temperature, pulse, and respiration taken and recorded. He should be supplied with a pajama suit, towels, and soap, be shown the bath and toilet rooms, and be instructed to take a tub or shower bath before going to bed. He should be instructed by the head nurse or ward master in the rules for patients as applicable to him.

The acutely ill patient must be put to bed immediately and all data and information taken at his bedside, after which, if it is permissible, he should be given a bed-bath. At the time of bathing, careful observation should be made for the presence of vermin or any contagious disease eruptions of the skin.

The ward officer or the medical officer of the day should be notified of the arrival of a new patient. Laboratory specimens of a routine nature for newly-admitted patients are secured and sent to the laboratory as soon as practicable. The patient is prepared for the medical officer's examination in accordance with the latter's wishes and requirements. The conscious patient should be told something of the examination which is to be made and what will be required of him. If he is nervous he should be reassured and made as comfortable as possible. When the examination is over, he should again be made comfortable.

**268. Visitors.** Visitors are allowed to see friends in the ward at a specified time, when their presence will in no way disturb other patients. When relatives or friends come from a distance to visit patients, in case of emergency or other unusual circumstances, they may be authorized by the commanding officer or the medical officer of the day to visit during a time other than the regularly designated visiting hours. Such visitors should be escorted by the head nurse or ward master to the patient concerned.

**269. Ward Telephones.** During the day telephones are to be used only for official business. Patients are not permitted to use the telephone unless specifically authorized to do so by the ward officer.

**270. Disposition of Patients from the Ward.** Disposition includes "discharge to duty," "discharge to quarters," "discharge on certificate of disability," "transfer to another hospital," or "transfer to another ward," "discharge from the Army" for other causes than disability, death, or desertion.

When a patient in hospital has recovered sufficiently from his disability to enable him to perform full duty, the ward officer through the commanding officer of the hospital will send such a patient back to his organization. Notice of disposition will be given to the head nurse or ward master at least 24 hours in advance. The patient's clinical record will then be completed and disposed of as described in par. 260. Any government property in his possession will be returned to the proper authorities. Upon departure he will be dropped from the ward list of patients, and his time of departure and condition will be noted on his clinical record. An attendant from the ward will accompany him to the room containing his personal effects. He will then be given his clothing, money,

and valuables. If he has complaints the ward officer will be notified and the patient returned to him for questioning or such action as the ward officer specifies.

In case of transfer to another ward, an attendant from the ward accompanies the patient to his new ward. Other dispositions (except death) are handled similarly under direct supervision of the ward officer.

A dying patient should be separated from other patients in the ward, preferably by removing him to a quiet room. Otherwise screens should be placed around his bed. Unnecessary conversation should not be carried on in his vicinity. The attendant should be attentive and sympathetic, both to the patient and his relatives.

In case of the death of the patient the ward master will comply with ward rules as stated in par. 258.

**271. Special Requirements for a Detention Ward.** The detention ward is a ward used for the treatment of prisoners or insane persons requiring hospitalization. In addition to the rules of the ordinary hospital ward the following requirements should be followed in the management of a detention ward.

No patient will be admitted to, nor any prisoner confined in, the detention ward except on the authority of a medical officer.

No persons except medical officers, nurses, and attendants on duty in the hospital will be allowed to enter the detention ward. Nurses and attendants will not permit loitering of unauthorized persons in the vicinity of the ward.

Each patient in the detention ward will be seen by the enlisted attendant once every hour and at such other times as deemed necessary by the medical officer.

A daily search, including all possible hiding places, for any property or dangerous implements that any patient may have concealed will be made each morning by the ward attendant.

All attendants are forbidden to strike or maltreat patients. Any attendant using force upon a patient shall be punished or bear the burden of proving that his action was necessary in defense of life or in preventing the escape of the prisoner.

When a sentry is posted in a ward by direction of the commanding officer, the ward master will turn his ward door key over to the sentry. When the sentry is no longer required to be posted the ward master will obtain the return of his key from the last sentry.

In the case of escape of a prisoner the ward officer, the prison officer, and the officer of the day will be notified at once. A written report to the surgeon, explaining all the circumstances relative to the escape, will be made.

**272. Special Requirements for a Contagious Ward.** Since communicable diseases may appear unexpectedly in regular hospital wards all medical personnel should be constantly on the alert to detect them. A ward especially prepared for the nursing care of contagious diseases is known as the "contagious" or "isolation" ward. Separate rooms or cubicles are provided for the segregation of patients having any one or more of the various communicable diseases. Enlisted attendants should be especially qualified in the nursing care of contagious disease. In addition to the requirements of nursing and ward management which are usually observed, the following requirements must be observed in the contagious ward.

Wear a cap and gown, and rubber gloves if necessary, while in the ward.

Thoroughly scrub the hands in running water before entering and leaving the ward and before meals. In addition, make a practice of keeping the hands away from the face.

Scrub the hands with soap and water and then immerse them in an antiseptic solution after doing anything for the patient or handling contaminated articles.

Wear glasses and a gauze mask over the nose and mouth when taking care of a contagious patient, being careful to avoid contact with secretions from the patient's body, especially the spray produced by sneezing and coughing.

Gowns should never be worn away from the immediate vicinity of the ward. When gowns are removed, turn them inside out and hang them up. Wash and scrub the hands again after their removal.

When working in a contagious ward, maintain the strictest personal hygiene, both off and on duty. Be certain that it includes plenty of sleep, nutritious food, and exercise in the open air. Avoid visiting other patients in the hospital.

All furniture in the ward should be wiped daily with a cloth dampened with a weak solution of phenol (1 to 40 solution).

Patients must not be permitted to violate any quarantine restrictions.

Do not tolerate carelessness by anyone, as it will prove dangerous.

## NURSING

**273. Nursing Defined.** Nursing means caring for the sick and injured under the direction of a medical officer. It includes the care of the patient and his surroundings, and the administration of diets, drugs, and treatment, as well as other tasks prescribed by the medical officer.

**275. The Medical Soldier as a Nurse.** In the Army the medical soldier must be prepared to perform nursing duties. Some medical installations operate without the services of members of the Army Nurse Corps; in others, the number of professional nurses is inadequate. Since nursing is important to the recovery of patients the medical soldier who is employed as such must be trained to perform the duty or assist in its performance.

**275. Qualifications of a Soldier Nurse.** The soldier nurse must demonstrate high physical, mental, and moral standards because all soldiers are not fitted for the task.

He must be interested in the duty, for otherwise he may find it easy to neglect certain requirements which require the utmost tact and understanding. He must be strong physically because, at times, the hours are long and the work severe. Strength will help him to ward off many diseases with which he will come in contact. He must be intelligent and mentally alert, for the medical officer will entrust him with instructions which must be followed with exactness. He must have the quality of "common sense" because many problems will arise which require the exercise of good judgment. All in all, the soldier nurse must be drawn from the finest soldiers of the Army in order that the group include only those who are willing to serve and are able to serve intelligently.

**276. Relationship Between the Medical Officer and the Nurse.** The nurse and the medical officer constitute a trained team. The medical officer is responsible for the proper treatment of his patients. Therefore, the nurse must demonstrate to the medical officer by faithful performance of duty his strict adherence to the principles of good nursing so that the medical officer can place confidence in his ability. Then and only then can he entrust patients to his care. The doctor relies on the nurse to observe, interpret, report, and record the symptoms and signs which will inform him of the patient's condition. He expects the nurse to do everything within his power to bring about the patient's recovery and to make him comfortable.

While the medical officer is present the nurse is his assistant. The nurse provides the necessary records, instruments, materials, and other articles requested by the medical officer. The highly-trained and efficient nurse will anticipate the medical officer's needs. Confidence in one another and smooth and intelligent operation will result in the best possible treatment for the patients and bring success to each member of this professional team.

**277. Importance of the Nurse to the Patient.** The patient

depends on the nurse to give him continuous attention during his illness. Skillful nursing will conserve the patient's strength and assist him in returning to mental and physical health. By means of various nursing procedures in conformity to the condition of the patient, the nurse can improve the comfort of mind and body. Cheerful and willing attention to the patient's wants and needs, and a tolerance to his abnormal desires due to his illness, will inspire the patient with confidence such as will encourage and help him. This type of service will soon secure the patient's cooperation, and he will, when able, assume more responsibility in caring for himself. Quite frequently the nursing care is more important to the successful recovery of the patient than the brief professional attention required from the medical officer. Time and nature are the healers, the doctor and the nurse their assistants.

**278. Making an Empty Hospital Bed.** The correct preparation of the hospital bed involves making it look neat, comfortable for the patient, and protection of the mattress against soiling or moisture.

*Articles necessary.* One mattress, 1 mattress cover, 3 sheets, 1 single blanket, 1 bed spread, 1 pillowcase, 1 pillow, 1 rubber draw sheet, and a bed. Have all articles on hand before beginning to work.

*Procedure.* Place a chair at the foot of the bed with the linens piled in the order they are to be used. Turn the mattress over, head to foot.

Remaining on the near side of the bed, proceed as follows: Place the mattress cover on the mattress. Place a large sheet evenly, the "right" side (surface of the sheet having the smooth hem) up, the narrow hem even with the upper edge of the foot of the mattress. Be sure that the sheet is straight and that the center fold is in the center of the bed. Tuck the upper end under the head of the mattress and miter (square) the corner. Tuck the sheet smoothly under the mattress as far as it will go along the side of the bed.

Rubber sheet: Place the rubber sheet in the center of the bed, with the upper edge 18 inches from the upper edge of the mattress.

Draw sheet: Fold a second sheet crosswise with the upper edges of the hems together, the "right" side up, and the hems toward the foot of the bed, and covering the rubber sheet. Tuck the ends of the sheet and rubber sheet under the mattress along the side.

Place the wide hem of a third sheet at the top of the mattress, "wrong" side (the surface of the sheet containing the fold of the hem) up, and the center crease in the center of the bed. Tuck it smoothly under at the bottom. miter the corner, then tuck it smoothly under along the side of the bed.

Blanket: Place the top of the blanket 8 inches from the top of the mattress. Tuck it smoothly under at the bottom. Miter the corner and tuck the blanket in smoothly along one side of the bed. If a double blanket is used, place the folded edge at the top, tuck one layer under the foot of the

mattress, and fold the other layer evenly with the upper edge of the foot of the mattress. Miter the corner and tuck the blanket smoothly under the mattress along the side of the bed.

**Spread:** Place one end of the bed spread even with the top of the mattress and tuck it in at the foot of the bed, miter the corner, making it smooth and square. Let the sides of the spread hang down. Pull the spread tight and smooth it out.

Go to the opposite side of the bed and proceed as follows: Fold all the bedding back from the head to the foot, then repeat the procedure of tucking in the sheets, blankets, and spread along the side and the foot of the bed as was done on the other side of the bed. Be sure that all wrinkles are removed by tucking the bedding in tightly and that the corners are square and neat.

**Pillow:** Slip the pillow into the pillowcase so that the corners will fit well. Press and smooth out the pillow, then place it at the head of the bed covering the upper edge of the spread.

If the bed is to be occupied soon, fold the bedclothes neatly down to 8 inches from the upper edge of the draw sheet.

**279. Making a Bed Occupied by a Patient.** It is necessary at times to make a bed which is occupied by a patient. Proceed as follows: Remove the upper bedding except one blanket. The patient should not be left without covering even in warm weather. Fold the bed spread and place all clothing removed on a chair. Remove the pillows. Loosen the lower bed linen. Air the patient's gown, shaking out all refuse, or change it if it is damp or soiled. Turn the patient on one side near and facing the edge of the bed. The lower soiled sheet is folded or rolled close to the patient's back; the clean sheet is rolled lengthwise to its middle and placed close up to the soiled sheet. Turn the patient on his opposite side upon the clean sheet and remove the soiled sheet. If a draw sheet is used the new draw sheet and draw sheet cover can be inserted at the same time as the clean bottom sheet. With an assistant on the opposite side support the patient at the shoulders and the hips and draw the bottom sheet tight, freeing it from all wrinkles. Proceed with the replacement of the upper bedding as for the hospital bed.

**280. Making an Operative Bed.** An operative or ether bed is a hospital bed made up to receive a patient following an operation. The bed must be ready when needed so there will be no delay; the bed clothing must be warm and protected from emesis (vomited material).

*Articles necessary.* Linen as for making an empty bed; 1 additional pillow and pillowcase; 1 small rubber sheet; 1 bath towel; 5 safety pins; mouth wipes (small pieces of gauze or toilet tissue); a paper bag; 2 emesis basins; 2 filled hot water bottles and hot water bottle covers with water at 125 degrees Fahrenheit; roller bandage; basin of ice water; 1 compress (use clean wash cloth); 2 tongue blades; pad and pencil; shock blocks and side boards (ask ward surgeon if they are to be used); chest protector; rubberized or protected pillow cover; scultetus binder for abdominal cases.

*Procedure.* Strip the bed and turn the mattress. Make the base as for a closed bed. Place a small rubber sheet at the head of the bed. Cover the rubber sheet with a towel and pin the four corners, placing the pins under the corners of the towel. Put on the top covers, tucking them in at the foot and on one side as for an open bed. Leave the side of the bed open for entrance of the patient. Make an 8-inch fold of the top covers on the side to be opened. Place one pillow between the head of the bed and the mattress. Hold the pillow in place with two strips of roller bandage. Put on neatly and tie each at the back. Place at least two hot water bags in the bed. Pin the paper bag to the side of the mattress at the upper front edge of the bed, so as to be convenient for the disposal of used mouth wipes.

On the bedside-stand place 2 emesis basins, the mouth wipes, 2 tongue blades, a basin with ice water and a compress. the paper pad and pencil.

Cover the second pillow with a rubberized pillow cover and pillowcase and place it on the chair.

Place the chest-pack (protector) and scultetus binder on the chair.

Place the shock blocks (used to elevate the foot of the bed) near the foot of the bed. Have the side boards (used to keep unconscious patient from rolling out of bed) conveniently placed nearby. They are used only when an attendant is not available continuously at the bedside of a patient who has had a general anesthetic.

*When patient returns.* Remove the hot water bags. Roll back the upper bedding. Transfer the patient to the bed. Cover the patient's shoulders. Tuck in the bedding at the foot and the side in the usual manner. Adjust the side boards and shock blocks. Apply the chest protector to the chest. Apply the scultetus binder if the patient is an abdominal case of surgery and if it is so ordered. Make the patient as comfortable as possible.

*Precautions.* Be sure that the mattress and pillows are well protected. Warm the bed thoroughly. Have all articles necessary for emergency near at hand. For any patient who has had a general anesthetic, side boards must be used unless he has a special nurse. For spinal anesthetic cases be sure that the foot of the bed is well elevated and do not use a pillow. Get authority from the medical officer before removing the shock blocks.

**281. Moving a Patient.** Never attempt to move a helpless patient unaided. Make all necessary preparation for the move before disturbing the patient.

*To turn the patient on one side.* Place one hand under the shoulder and one hand under the buttocks on the opposite side of the patient. Then turn him toward you by pulling.

*To lift a patient up in the bed.* This requires two attendants, one on each side of the bed. Place hands under shoulders and under the thighs. Have the patient pass an arm behind each attendant. In unison, the attendants draw or slide the patient up in the bed to the desired location.

*To set a patient up in the bed.* Have the back-rest and

pillows ready. Draw the patient well up in the bed. Raise him to a sitting position, supporting his back and shoulders. Arrange the back-rest and pillows. Protect the shoulders with covers, if necessary.

For cardiac cases place pillows under the arms and inflated rubber rings under the buttocks. Provide a stand if available so that he may lean forward and rest his arms and head on it.

*To place a bed-patient in a chair.* Place two pillows in the chair, one over the back and one over the seat. Cover both pillows with a blanket. Place the chair so that no unnecessary steps or turns need to be taken. Raise the patient to a sitting position and put on his robe. Fold the bedding to the foot of his bed. Put on his socks and slippers. Swing the patient to the side of the bed and place his feet on the floor. Wait a short time to let the patient rest. Assist him to stand, turn him slowly, and place him carefully in the chair. If he is unable to stand the patient must be lifted in a sitting position from the edge of the bed into the chair.

*Lifting a patient from a stretcher to a bed.* To lift a patient from a stretcher to a bed or to transfer him from one bed to another, try to avoid all possible discomfort and strain to the patient.

*Requirements.* Three attendants, a stretcher with the patient wrapped in blankets, and an open bed. If the transfer is from one bed to another, place the bed containing the patient in the same relative position as stated below for the stretcher. If the transfer is from the bed to the stretcher, reverse the process.

*Procedure.* Have the bed properly prepared to receive the patient. Bring the stretcher to the bed, placing the head of the stretcher at the foot of the bed at an angle of about 135 degrees. The three attendants come to the side of the stretcher toward the head of the bed.

One attendant places his hands under the patient's head and shoulders. Another attendant places one arm under the patient's back and the other under his buttocks. He should be the tallest of the three attendants. The remaining attendant places one arm under the patient's thighs and the other arm under his ankles.

The attendants then lift the patient in unison, holding him so that he rests against their chests. Together they walk in step along the stretcher and the bed to the correct place alongside the bed. They lower the patient gradually to the bed.

One attendant covers the patient and removes the stretcher blanket. Others remove the stretcher.

**232. Temperature, Pulse, and Respiration.** The nurse determines and records the temperature, pulse rate, and respiration rate of the patient as directed by the medical officer.

*Articles necessary.* Watch with second hand; thermometer tray containing alcohol, 70 per cent; clean cotton; cresol solution in a basin; and a sterile clinical thermometer.

*Taking temperature by mouth.* Remove the thermometer from the receptacle containing disinfecting solution. Wipe it with a cotton pledget saturated with 70 per cent alcohol from

the bulb upwards. Wipe it again with a dry cotton pledget. Carry the thermometer in a cotton pledget to the bedside. Shake down the mercury column in the thermometer. Place the thermometer in the patient's mouth, with the bulb end under the side of the patient's tongue.

Instruct the patient to keep his lips closed. At the same time take the pulse rate and respiration rate. After two minutes, remove the thermometer and read the height of the mercury column on the scale. Wipe off the thermometer with a clean pledget dipped in 70 per cent alcohol; wipe from the top toward the bulb. Replace the thermometer in the disinfecting solution. Record the temperature, pulse rate, and respiration rate on the patient's chart.

*Taking temperature in the rectum.* Taking the temperature in the rectum is the most accurate method. Turn the patient on his side. Wipe a rectal thermometer. Shake the mercury to 95 degrees Fahrenheit on the scale. Lubricate the bulb with vaseline. Insert the bulb into the rectum until it slips past the internal sphincter (about 1½ inches). Let it remain in position for two minutes, steadying it if it tends to slip out. Meanwhile, take the pulse rate and rate of respiration. Remove the thermometer, read it, and wipe and clean it thoroughly.

**Precautions:** Do not place the rectal thermometer in the tube containing the mouth thermometer. Do not take the rectal temperature of a patient after he has had rectal surgery or rectal disease. Do not allow the patient to insert the thermometer himself.

*Taking temperature in the axilla (armpit).* Pull a sleeve away from the armpit. Place the clinical thermometer deep in the axilla. Have the patient drop his arm to the side, holding it snugly to his chest with his hand across the opposite side of his chest. Leave the thermometer in the axilla for five minutes. Meanwhile take his pulse rate and rate of respiration. Remove the thermometer, read it, and cleanse it. This method is used in cases of extreme restlessness or when other methods cannot be employed.

*Care of the clinical thermometer.* Clinical thermometers should not be left in the sun or near a radiator or electric light. Do not wash them in hot water. Do not leave a thermometer on the bedside table of a patient. When handling the clinical thermometer be sure the hands are dry, as the thermometer will slip out of grasp easily.

To shake down the mercury, grasp the thermometer securely by the upper end (never hold it by the bulb), bend (flex) the hand, and give a quick sudden movement of the wrist as when cracking a whip. Always read the thermometer just before placing it in the patient's mouth to be sure that the mercury has been shaken down.

*General instructions on taking temperature, pulse rate, and rate of respiration.* The temperature of surgical patients should be taken at four-hour intervals until sutures or skin clips are removed and as long as there is any drainage. Then, if the temperature is normal, change to twice a day.

Patients able to walk should be seated while temperatures are taken.

Patients are not to be awakened for taking of temperature unless it is so ordered by the ward officer. A suitable set of schedules for taking temperature is shown below:

If taken twice a day—8:00 A.M. and 4:00 P.M.

If taken every 4 hours—8:00 A.M., 12:00 noon, 4:00 P.M., and 8:00 P.M.

If taken every 2 hours—8:00 A.M., 10:00 A.M., 12:00 noon, 2:00 P.M., 4:00 P.M., 6:00 P.M., 8:00 P.M., and 10:00 P.M.

If a patient develops a sudden rise or fall in temperature, read it each two hours.

Temperatures are to be taken every half hour during a chill until the temperature begins to fall, then every two hours until ordered discontinued. In case any temperature reads unexpectedly low, or shows a sudden elevation, verify it at once with a different thermometer, keeping it in the mouth 5 minutes, or take the temperature by rectum. Record the temperature thus taken.

In all cases the pulse rate and the rate of respiration must be counted for a full minute.

Do not take temperature by mouth for 20 minutes after a hot or cold drink.

Do not take temperature by mouth of a mouth breather.

Do not take temperature by mouth of restless, delirious, unconscious, or insane patient.

**283. Rules for Charting.** Charting includes the recording of all important events, symptoms, signs, treatment, and general condition of the patient on each patient's clinical record (Form 55a, M.D., and accompanying lettered forms). Nothing of importance should escape the notice of the nurse as it may be of great value to the patient and to the doctor. *Subjective symptoms* (those complained of by the patient) and *objective symptoms* (those noted by the observer) should be recorded promptly and accurately.

The patient's clinical record (Form 55a, M.D., and accompanying lettered forms) should be filled in, in so far as practicable, at the time they are assembled and whenever a new form is added. All insertions should be written clearly and correctly in black ink, except the night recordings between 7:00 P.M. and 7:00 A.M., which are written in red ink.

Records should be accessible only to ward officers and such military personnel as authorized by them.

Nurses and ward attendants are responsible for strict compliance with written orders.

Records should be printed, not written.

Spelling and composition should be correct.

Use periods at the ends of statements.

Notations recorded should be accurate, concise, and neatly printed.

Always record the *exact time* of an occurrence.

Notations are to be made immediately after service is rendered.

Only authorized abbreviations are allowed.

Do not use chemical formula—write it out.

Ditto marks should not be used.

Use all the space needed to make the record clear. Use additional blank forms.

When medication is administered, other than by mouth, the channel of administration must be indicated. Example: "Per rectum," etc.

Liquids taken by mouth are recorded in cubic centimeters (c.c.) rather than in ounces.

To indicate the separation of one day from the other on the patient's clinical record, midnight lines are used. They are lines formed by drawing two parallel lines in red ink across the page and writing in the new day and date between the lines. For surgical cases, record should be made between the midnight line of the post-operative day, using Roman numerals to indicate the day. For example: "Tuesday, March 24, 1941. III Post-operative Day." (Written in red ink).

All medicines, treatment, preparations, etc., are to be charted by the nurse who administers them.

Chart the change of surgical dressings, by whom made, and the amount and character of drainage.

In charting stools and urination the number of stools are indicated by Roman numerals; the urine is indicated by Arabic numerals and is recorded in cubic centimeters.

**284. To Give and Remove a Bed Pan.** The articles necessary for this procedure are a bed pan, bed pan cover, toilet paper, and screens.

**Procedure.** Screen the bed from view. See that the bed pan is clean, dry, warm, and covered with a bed pan cover. Take the bed pan to the patient's bedside. Place the bed pan cover between the foot of the mattress and the foot of the bed. Instruct the patient to flex his knees. Place one hand under the small of the back to help raise and steady the patient. Slip the bed pan under his buttocks with the other hand. The patient may assist, if he is able, by pressing both heels and shoulder on the bed and raising the middle of his body.

Remove the bed pan in the same manner. Always leave the patient dry, clean, comfortable, and his bed in order. Rinse the pan with cold water, using a brush if necessary. Unless the hospital has a bed pan sterilizer, cleanse it with cresol solution and rinse it with hot water. Dry it and put it away.

When charting, describe the defecation according to amount (large, medium, small), character (soft, liquid, well-formed), color (brown, yellow, clay-colored, etc.) and any abnormalities such as worms, blood, pus, mucus, etc. Measure and chart the amount of urine.

**285. The Enema.** The object of an enema is to introduce fluid into the colon by way of the rectum for the purpose of cleansing the intestinal tract, relieving distention and gas (flatus), acting as a local remedial application, and to administer medication or nourishment for general systemic effect.

**Articles necessary.** If a large quantity of fluid is to be given, secure a clean tray containing an enema can, clamp, glass connector, rubber tube, a short colon tube (if used), and an enema tip; a warm bed pan and several large pieces of

newspaper; a suitable lubricant; the solution as ordered; and an irrigating standard (high frame with hooks for holding bedside apparatus).

If a small quantity of fluid is to be given, secure a clean tray containing a funnel and colon tube; a pitcher of the solution as ordered; the desired lubricant; a warm bed pan; several large pieces of newspaper.

*Procedure.* Screen the bed from view. Have the patient lie on his left side or on his back. Protect the bed with the newspapers. Make the patient comfortable.

Unclamp the tubing and expel the air and cold water into the bed pan. Lubricate the rectal tip. Introduce the tip gently into the anus. The colon tube should not be introduced more than 6 inches. Guard the patient from all unnecessary exertion, discomfort, and exposure. Release the clamp and permit the solution to enter the colon slowly until the desired amount is given.

Place the patient on the bed pan and protect the lower part of the bed. Report to the head nurse or ward surgeon if the patient is unable to expel the solution. At the conclusion of the treatment, turn the patient on his side and cleanse the buttocks carefully with toilet tissue. Leave the patient clean, dry, and comfortable.

Inspect the contents of the pan. Preserve any specimen of diagnostic value until viewed by the medical officer. Chart the time of treatment, giving the amount, kind, and temperature of solution used. Describe as to amount, color, consistency, and flatus expelled.

**286. Catheterization.** The object of catheterization is to withdraw urine from the bladder by artificial means. It is done when the patient is unable to urinate, when an uncontaminated specimen of urine is required, before operation (if ordered by the medical officer) to make sure the bladder is quite empty, and in cases where there is involuntary urination or dribbling for an overdistended bladder.

*Articles necessary.* Enamel tray, sterile towel, 1 sterile basin for urine, sterile receptacle containing catheters, sterile receptacle containing green soap and one containing boric acid or argyrol solution, if necessary, 6 sterile cotton pledgets, newspaper for water, sterile forceps, and lubricating jelly (sterile).

*Procedure.* Wash the hands well, using a brush and soap. Have the patient lie on his back with his legs slightly separated. Place a newspaper under his hips and thighs for protection of the bed. Stand on the right side of the patient with the catheterization tray on your right if you are right-handed. Place a sterile towel, unfolded, on the thigh. With the left hand pick up the penis and with the right hand wash it well from the tip back, using a sterile pledget soaked in green soap. Then rinse the penis well with sterile water or mild boric acid solution or the solution prescribed by the ward officer as standard.

With the right hand pull the sterile towel on the thighs upward by the corners so that the penis can rest on it.

With a sterile forcep place sterile catheter on the towel.

Place some lubricant on the towel over the catheter tip.

Hold the penis with the left hand. With the sterile forcep pick up the tip of the catheter and introduce it gently into the urethra. Do not touch the catheter at any time until it is in the bladder.

Have a receptacle ready to receive the urine.

When the bladder is empty remove the catheter slowly with the right hand. Hold a piece of gauze under the tip of the penis so as to catch the urine remaining in the catheter. Wipe off the penis with a clean gauze. Remove all the apparatus and make the patient comfortable.

**287. Bladder Irrigation.** The object of bladder irrigation is to relieve pain, inflammation, and congestion.

*Articles necessary.* The same articles are required as for catheterization plus the following: a sterile pitcher containing sterile solution (as ordered for the irrigation) at about 105 degrees Fahrenheit; a sterile basin for return solution; and a sterile glass urethral syringe.

*Procedure.* Proceed to empty the bladder as in catheterization. When the bladder is nearly empty, attach the syringe and pour into it 2 to 4 ounces of sterile irrigating solution. Allow solution to run in by gravity unless otherwise ordered. Before the syringe is entirely empty detach the syringe and allow the solution to flow into the enamel basin. Before the return flow from the bladder ceases, introduce more solution and continue until the prescribed amount of solution has been used.

Finish as in catheterization. Chart the time of treatment, the amount and kind of solution used, and the character of the return flow.

*Precautions.* Always use a rubber catheter. Keep the patient's feet and body warm. Genito-urinary diseases react unfavorably to cold.

**288. Bladder Instillation.** The object of bladder instillation is to introduce into the bladder some antiseptic solution which is to remain and act as an application to the mucous membrane.

*Articles necessary.* Same as for catheterization and irrigation.

*Procedure.* Proceed as for catheterization. When the bladder is nearly empty or after the bladder has been irrigated, attach the syringe to the catheter and inject the fluid into the bladder.

Detach the syringe and complete the procedure as in catheterization.

Chart the time, the amount of urine withdrawn, the treatment ("bladder instillation") with the amount and strength of the drug used, and any symptoms of distress caused by the instillation.

**289. Laboratory Specimens.** The general rules for collection of specimens are the following: Always have the correct receptacle for the specimen to be collected. The receptacle must be perfectly clean. All specimens must be accompanied by appropriate laboratory request blank, completely filled out.

*To collect routine urine specimen.* Use routine specimen bottle, marked with routine label filled out completely. Collect specimen in clean bed pan or urinal. Measure and pour about 4 ounces into specimen bottle. If the patient is to collect the specimen, explain carefully what is to be done.

*To collect sterile urine specimen.* Catheterize the patient and collect the urine in a sterile bottle covered with a sterile 4" x 4" gauze.

*To collect a 24-hour urine specimen.* Select a large bottle (gallon), mark with the date, the ward, and the name and register number of patient, and the hour started. Start at 6:00 A.M. if possible.

Have the patient void on the hour of starting. Thereafter save all urine voided until the same hour is reached 24 hours later. Have the patient void on the hour of completion and include in the specimen. The entire specimen is well shaken and the entire amount measured. Pour about 4 ounces of the composite specimen into a specimen bottle and send to the laboratory. The total amount of urine saved in 24 hours must be marked on the laboratory slip and on the patient's clinical record (Form 55a, M.D.).

*Precautions.* It is important to have all urine voided until the 24 hours are completed. Do not spill any, do not allow the patient to defecate when voiding, and do not mix specimens of different patients. Keep the specimen in a cool place.

Example: March 23, 6:00 A.M.—Have the patient void, throw away the urine. Save all urine during the day and night. March 24, 6:00 A.M.—Have the patient void; save the urine.

*To collect a stool specimen.* Immediately after defecation, take from the bed pan a specimen of the feces about the size of a walnut. Use a tongue blade for this purpose. Place the specimen in the feces cup and cover it with a paper lid. Fill out the laboratory slip (Form 55n, M.D.), noting the hour the specimen was passed, and send it with the specimen to the laboratory.

*To collect a stool series.* Collect one single specimen of feces in every 24-hour period. The medical officer orders the number of days, usually 3 to 6 days. Take each specimen to the laboratory while warm. Indicate day of stool series on the laboratory blank. No oil is given for catharsis during this interval. Usually, bile salts or saline cathartics are used.

*To collect a sputum specimen.* Instruct the patient to expectorate material coughed (not nasal) into sputum cup. Label the specimen cup, fill out Form 55c, M.D., and send both to the laboratory.

**290. Baths.** There are many reasons for giving baths, and there are many different kinds of baths. Ordinarily they are given to promote cleanliness, but in the hospital other types of baths are used to stimulate circulation, to produce sweating, to quiet the nervous system, or to reduce the patient's temperature. The bath may be general or limited to a portion of the body. Variations in temperature are used, and chemicals may be added to the bathing solution to secure the desired effect of the bath. Soldiers employed in physiotherapy departments should study textbooks devoted to

therapy by physical measures, the most important of which is water treatment. For the medical soldier employed in the hospital ward, the most common bath administered is the cleansing sponge bath.

**291. Cleansing Sponge Bath.** The objects of a cleansing sponge bath are: to refresh the patient; for cleanliness and to free the body from odors; to stimulate the superficial circulation.

*Articles necessary.* Two basins of hot water; alcohol and powder for back rub; clean face towel, bath towel, and wash cloth; bath towel and wash cloth on stand that were used the day before; clean gown when needed; soap dish and soap; and comb and nail file.

*Preparation of the surroundings.* Close the windows. The room temperature should be between 70 and 75 degrees Fahrenheit. Place a screen around the patient's bed. Clear off the bedside table and place it so articles used for bathing may be placed on it. Arrange extra pillows neatly on the chair at the foot of the bed. Remove the bed spread. Fold and place it over the back of the chair. Place the clean linen on the chair. Remove the pillow from under the patient's head. Put on clean pillow case and place it on the chair. Use the soiled pillow case as a container for the soiled linen. Loosen the upper bedding, all the way around the bed. Give the patient the bed pan and encourage him to use it. Remove the patient's gown and place it over the back of the chair.

*Procedure.* Wipe the perspiration from the patient with a clean towel. Protect the bed with patient's towel that he has used previously. Use the patient's wash cloth with cleansing soap and use a clean wash cloth for rinsing. Wash in sequence: face, front of neck and ears, upper extremities, chest, abdomen, lower extremities, back and genitalia. Dry each part or area thoroughly before proceeding to the next.

Cleanse the mouth and brush the teeth. Then wash the face and dry.

*Upper extremities:* Expose the arm nearest to you. Protect the bed with a towel under the arm. Bathe the arm and forearm. Give special attention to the armpit and dry it thoroughly. Place a basin of soapy water on the towel so the patient may place his hand in the basin. Wash the hand and dry it thoroughly. Repeat on the other arm and hand. Clean and cut the fingernails.

*Chest:* Loosen the chest pack (protector) and expose the chest. Bathe and dry thoroughly.

*Abdomen:* Cover the chest with a bath towel and turn down the blanket, being careful of any surgical dressings. Loosen and remove the abdominal binder if any is present and if it is permissible to do so. Bathe and dry thoroughly.

*Lower extremities:* Protect the bed. Drape the extremity carefully, leaving the nearest limb exposed. Wash the thigh and leg thoroughly, then dry them thoroughly. Place a basin of soapy water on a towel near the foot of the bed. Allow the patient to place his foot in the basin. Wash it. Support and move his foot from the basin and place it on a bath towel. Dry it, paying special attention to the heels, ankles,

and the areas between the toes. Clean and cut the toe nails. Repeat the procedure on the other thigh, leg, and foot.

**Back:** Turn the patient so his back will be toward you. Protect the bed. Examine those parts especially subjected to bed sores. Expose the back and bathe it. Dry it thoroughly. Rub the back with alcohol, paying particular attention to bony prominences and reddened areas. Place the abdominal binder (if any) in position. Turn the patient carefully on his back.

**Genitalia:** If the patient is able, instruct him to finish his bath. This will include bathing of the genital area. Provide him with a soapy wash cloth. Place the bath water so it is convenient for him and give him a bath towel. If the patient is unable to proceed, the attendant completes the bath. Be certain that the area is dried thoroughly.

**To finish:** Put a clean gown on the patient. Comb his hair. Remove all bathing equipment, dirty linen, etc. Make up the patient's bed neatly.

**292. Care of the Hair.** It will be necessary to comb the patient's hair several times daily. Place a towel over the pillow under the patient's head. Raise his head on one side and brush and comb the hair. Then turn his head and brush and comb the hair on the other side. Raise his head and comb the hair on the back of his head.

**To give a shampoo to a bed-patient.** The object of the shampoo is to cleanse the hair and to stimulate and clean the scalp.

**Articles necessary.** Three bath towels; 1 face towel; 1 large rubber draw sheet; newspapers for the floor; 1 small rubber sheet or rubber pillowcase; 2 large pitchers of water at 105 degrees Fahrenheit; 1 small pitcher of soap solution; 1 small pitcher; and cotton pledgets.

**Procedure.** Carry all articles to be used to the bedside. Remove the spread and loosen the upper bedding. Bring an extra chair to the side of the bed. Protect the floor and chair with newspapers. Remove the pillows and replace them with a small rubber sheet covered with a bath towel. Slip the patient's gown low about his neck and pin a bath towel snugly around it. Place pillows under the patient's knees.

Make a pad of a bath towel and a large rubber sheet; roll the towel lengthwise; roll the edge of the rubber sheet over it; shape them into a horseshoe roll and place under the patient's head, putting the free end so it will drop into the foot tub.

Place the foot tub on a chair under the drainage pad. Bring the patient well over to the side of the bed. Place some cotton in his ears. Wet the hair by pouring warm water over it, using the small pitcher. Apply the soap to his hair and rub it into the hair.

Repeat, adding soap solution until there is a good lather. Rub the scalp well. Rinse the hair thoroughly. Repeat the soaping and rinsing. Dry the hair with a bath towel. Remove the rubber sheet and place it in the foot tub. When the hair is thoroughly dried, comb it.

**Precautions.** Do not wash a patient's hair without orders

from the medical officer. Be sure that all the soap is rinsed off.

**293. Care of the Back.** Proper care of the back will prevent bed sores (decubitis). The symptoms of a bed sore are heat, redness, tenderness, and discomfort.

Preventive treatment against bed sores is the responsibility of the nurse. Protect the bony prominences by relieving pressure on them. The following mechanical devices are used for this purpose: rubber rings, cotton rings, cradles, and back rests. The following bedside care will assist in preventing bed sores: change the position of the patient frequently; keep his skin clean and dry; keep his bed free from wrinkles and crumbs; handle him carefully, especially when giving him the bed pan; rub his back with alcohol and powder; rub extremely dry skin with oil; paint reddened areas with compound tincture of benzoin.

The treatment of bed sores is as follows: Report reddened spots and abrasions to the head nurse or ward officer. Chart the time and method used in dressing abrasions. For redness and slight abrasion of the skin, keep the skin clean, apply castor oil and bismuth, antiseptic powders, ichthyol ointment, or compound tincture of benzoin. Apply sterile dressings.

**294. Care of the Mouth and Teeth.** The object of dental hygiene is to keep the teeth in good condition and to prevent the formation of sores.

*General instructions.* Always wash your hands before and after cleansing a patient's mouth. Use fresh solution and clean applicators for each cleansing. Never dip the applicators in the mouth wash a second time.

*Routine care for bed patients who are able to brush their own teeth.* At the time of the morning toilet and again in the afternoon, provide the patient with a toothbrush, mouth wash (2 ounces), a glass of water, and an emesis basin. Protect the patient's bed garments and bed with a towel and place the other articles within his reach.

*Routine care for patients who are helpless.* Wash your hands. Place the towel slightly under the patient's head and over his shoulder. Place the emesis basin near his mouth. Pour some solution over the brush. Have the patient open his mouth. Brush with a slow, sweeping motion. Rinse the brush frequently. If the patient has a coated tongue, cleanse his tongue with a gauze dipped in a mixture of one dram of glycerine and a few drops of lemon juice.

Special care is given to very sick patients, patients with high fever, unconscious patients, and surgical patients just before going to surgery.

**295. Feeding the Patient.** Food is essential to the maintenance of life. When a person is sick he must have food, otherwise he cannot be returned to health. Since sickness disturbs the normal processes of digestion and interrupts the normal desire for food, the act of feeding a patient must be intelligently planned and painstakingly accomplished.

*Rules for feeding patients.* Arrange the patient's bedding so he will be comfortable. Place the table and tray in a convenient position. Have the room or ward in proper order so there are no disturbing sights which oppose the enjoyment

of the food. Prevent serving meals immediately following treatments, application of dressings, departure of visitors, or the medical officer's inspections, as the patients may be somewhat restless. Avoid all excitement and have the patient alone and unobserved by others. Do not discuss food with the patient and do not ask the patient to decide what he will have. Be strict in giving food in accordance with the medical officer's orders. Never give anything to the patient, either to drink or eat, without being fully aware of what the patient is permitted to have.

Arrange the tray as nicely as possible, making it attractive to the patient. Avoid dropping or spilling the food dishes. Place it before him in an attractive condition. If it is to be hot, serve it hot; if it is to be served cold, serve it cold. Do not hurry the patient and give him all necessary assistance.

Remove dirty dishes promptly. Note how much the patient has eaten, what he has eaten, and what he has not eaten.

In feeding liquids to a patient use drinking cups or glasses; cup, saucers, and spoon; medicine dropper; glass drinking tubes; or straws, depending upon his condition. Never use glass tubes for small children or delirious patients. Give liquids slowly, watching the patient's color so that you may be certain it is not going into his windpipe.

The time spent in feeding the patient correctly is never wasted. Often it is of greater importance than the medical measures devoted to the treatment of the disease.

**296. Drugs and Their Administration.** Drugs may be given by various methods. The channels of administration commonly employed in the hospital ward are as follows:

*By mouth.* To produce local effect in the gastro-intestinal tract and absorption into the blood stream.

*By rectum.* Enemas and suppositories.

*By inhalation.* For infections in the respiratory tract and absorption into the blood stream.

*By inunction.* Applications of ointments to the skin by rubbing them in.

*By injection.* Subcutaneously—under the skin; intracutaneously—into the skin; intramuscularly—into a muscle; intravenously—into a vein; intraspinaly—into the spinal canal. When normal saline is given into the deep subcutaneous tissues (upper inner thigh, under the nipple area, or anterior abdomen) it is known as hypodermoclysis. The saline may contain some other substance such as glucose (5 per cent).

**297. Administration of Medicines by Mouth.** The majority of medicines are given by mouth (orally).

*Articles necessary.* Tray covered with X-ray film or similar material; medicine glasses; and medicine tickets (small 1½-inch square cards for each patient, showing medicine to be given and dosage).

*Procedure.* Arrange the medicine glasses on the tray so that each medicine ticket has a glass to accompany it. Make out the tickets for new medicines ordered since last issue of medicines. When dispensing the medicine from the medicine cabinet proceed as follows: Read the label and take the bottle of medicine from the shelf. Uncork. Read the label again. Hold the medicine glass or minim glass in the left hand and

on a level with the eye. Always shake the bottle before pouring out its contents. Pour out the exact amount from the side of the bottle opposite the label. Give your undivided attention to pouring medicine. Place the medicine glass on the ticket on the tray. Wipe off the neck and base of the bottle with a damp cloth. Recork and again read the label as the bottle is replaced on the cabinet shelf. Read the patient's name on the medicine ticket, verify it with the name tag on the foot of his bed, and call the patient by name. *Stay with the patient* until the medicine is taken.

Cleanse the tray and leave it in readiness for future use.

**Precautions.** Have the ward officer's order for all medications. Do not give medicines poured by another person. Do not leave medicines or medicine glasses on a patient's table. Keep all the medicine bottles marked plainly. *Never give medicine from an unmarked bottle.* Give medicine at the time prescribed.

Order only a small amount of medicine from the pharmacy, as it deteriorates with age.

Use the minim glass for measuring minims and the medicine dropper for drops. Use the medicine glass for measuring drams and ounces. Use a teaspoon for measuring teaspoonfuls.

Give all syrupy cough medicines without water unless otherwise ordered. Dilute saline cathartics with small amount of water unless otherwise ordered. Give the following well diluted and through drinking tube: acids, iodides, arsenic, and iron.

Keep all narcotics in a locked cupboard. Narcotics must be given out by the head nurse in a labeled envelope.

Know the action expected from the drug. Know how to administer the drug. Watch for signs of cumulative poisoning.

Make medication as attractive as possible, especially oils, bitters, etc.

Watch for individual idiosyncrasies (peculiar reactions exhibited by some patients to certain drugs).

Do not tell the patient what kind of medicine he is taking.

**298. Hypodermic Injection.** A hypodermic injection is given to obtain prompt action from a drug, to prevent irritation of the mucous lining of the stomach, and to administer a drug when a patient is unable to swallow.

**Articles necessary.** A tray covered with a paper towel; alcohol lamp and spoon, a box of matches; a glass container with syringes in alcohol; needles (hypodermic) in a glass container; cotton pledgets; and 4 bottles in a rack containing alcohol for cleansing the skin, ether, alcohol for forceps, and distilled water.

**Procedure for subcutaneous injection.** The hypodermic needle to be used is boiled in distilled water in a spoon for one minute. Be especially careful in handling the needle to avoid blunting the point. The needle is taken out of the spoon with forceps which have been disinfected with alcohol. Place the needle on a syringe and rinse the syringe out with a portion of the boiled water in the spoon.

Pick up the tablet desired from the medicine envelope by touching the tablet with the dampened end of the syringe

plunger. Draw up sufficient water from the spoon to dissolve the tablet—8 to 10 minims. Place a cotton pledget saturated with alcohol over the needle. Carry the syringe thus prepared to the patient.

Select an area, preferably the outer surface of the arm or thigh, and cleanse the skin with the cotton pledget saturated with alcohol; pinch up the flesh of the cleansed area with the forefinger and thumb and quickly insert the needle into the subcutaneous tissue.

Press the piston of the syringe slowly and gently until the solution is expelled. Then withdraw the needle and wipe the skin area with the pledget. Massage around the site of the puncture but not directly over it.

*To administer a medicine put up in ampules or rubber-capped vials.* In giving a hypodermic from solutions contained in ampules or in rubbercapped vials, always cleanse the ampules or rubber caps with an alcohol sponge. Withdraw the plunger in the syringe to the desired point. Hold the hilt of the needle when withdrawing it. It is sometimes convenient to force a little air into the vial before drawing up the solution—as for insulin.

*Charting.* Chart the hour, drug and amount, and patient's reaction. Also reason for giving narcotics—such as pain or restlessness.

*Hypodermoclysis.* Hypodermoclysis, the injection of sterile normal saline fluid into the body, is given in the same manner as other subcutaneous injections except more fluid is given (200 to 1500 cubic centimeters). The flask containing the saline is connected to the large subcutaneous needle or needles by a sterile rubber tubing.

*Procedure for intramuscular injection.* The technic is the same as that for giving a subcutaneous hypodermic, but a longer needle is used and the needle is inserted straight into the muscle. Stretch the skin tightly over the part, pressing on it in one direction with the thumb and in the other with the first finger of the left hand. Large, heavy muscles are chosen, such as those of the thigh and the gluteal muscles of the buttocks.

*Precautions.* Use aseptic technic; the drug must not be boiled in the water; care must be observed to prevent breaking the needle in the flesh; care must be taken to expel the air from the barrel before inserting the needle into the skin. Insert the needle in the direction of the heart and in the fleshy parts of the body, such as the outer surfaces of the arms and legs and thighs, never over bony prominences.

When giving an intramuscular injection it is good policy to withdraw the plunger slightly after its insertion into the flesh to make certain the needle is not in a blood vessel. If blood appears in the bottom of the syringe, redraw the needle and reinsert in a new area.

*Fractional dosage.* Occasionally it may be necessary to give a fractional part of a medicine tablet instead of the actual dosage of the tablet as prepared. For instance, it may be desirable to give  $\frac{1}{12}$  grain of morphine sulphate, and the smallest grain tablet of morphine sulphate on hand is  $\frac{1}{8}$  grain. First it is necessary to determine how much of the  $\frac{1}{8}$  grain

tablet will be needed. Divide  $\frac{1}{12}$  grain (desired dose) by  $\frac{1}{8}$  (dose of tablet on hand) or  $\frac{1}{12}$  times  $\frac{8}{1} = \frac{8}{12}$  (portion of  $\frac{1}{8}$  tablet which should be used).

Since it is difficult to proportion a tablet, the tablet is dissolved in sterile water, using the number of drops as indicated by the denominator of the above fraction  $\frac{8}{12}$  or 12 drops. The 12 drops now contain the original dosage of  $\frac{1}{8}$  grain which was in the prepared tablet. Draw 8 drops (numerator of the fraction  $\frac{8}{12}$ ) of the 12 into a syringe, and the syringe contains  $\frac{8}{12}$  of the  $\frac{1}{8}$  grain which was dissolved or the desired dose,  $\frac{1}{12}$  grain.

Do not dissolve the tablet in less than 10 drops of water.

**299. Intravenous Infusion.** The objects of an intravenous infusion are to replace fluid after a hemorrhage, to stimulate the heart action, to assist in eliminating toxic materials, to fill the blood vessels and maintain the blood pressure, and to provide nourishment.

*Articles necessary.* Enamel tray covered with paper towel, vein set (obtain in surgery when getting solution), and sterile vein-needle in a container. Have the doctor select the needle, tourniquet, iodine and alcohol, adhesive plaster, 4 sterile cotton pledgets, 1 clean 4" x 4" gauze, small rubber sheet and towel, bandage scissors, irrigation standard and 2 extra vein-needles.

*Procedure.* If a large quantity of fluid is to be given the solution is placed in a sterile flask and connected to a syringe. When smaller quantities are given, the amount can be given with suitable syringe containing the solution.

Using the flask: Warm the solution in hot water. Do not allow hot water to run over the flask. Do not boil or set over a flame. Test the heat of the flask against forearm. Connect the flask, vein-set, and needle. Run the solution through the tubing to expel any air. Place on a tray with the needle in a cotton pledget saturated with alcohol. Carry everything to the bedside table and assist the medical officer. Place a rubber sheet and towel under the patient's elbow.

An area about 3 inches in diameter around the site of puncture is then disinfected with iodine and alcohol.

The medical officer again allows some solution to run through the needle to see that the air is expelled from the tubing and that the solution is warm before inserting the needle into the vein.

Fasten the tubing in place with adhesive tape. Place a 4" x 4" sterile gauze near the hilt of the needle between the tubing and the forearm. Watch the solution as it runs in. After the correct amount has been given, clamp the tubing; then remove the needle. Wipe the site of puncture with a cotton pledget saturated with alcohol. Apply either a colodion dressing or have the patient hold the pledget over the site of the puncture.

Make the patient comfortable. Clear away the used articles and return vein-set and flask to the operating room. Draw ether through the needle.

Chart: time begun and ended, amount given, per cent and kind of solution used, and the patient's pulse rate before and after infusion.

Using a syringe. Use a Luer syringe, 2, 10, 20, or 50 cubic centimeter, according to the amount of medication to be given. Select or have the medical officer select the vein-needle. Draw the solution into the syringe. Cover the needle with a sterile cotton pledget. Have iodine, alcohol, tourniquet, and sterile cotton pledgets on the tray.

*Precautions.* Use aseptic precautions with all materials which come in contact with the solution or the skin. Take the pulse rate before and after the treatment. Expel the air from the tube and needle (or syringe) before inserting needle. Do not allow the solution to become cold. If the patient is restless, a nurse must be in attendance during the procedure, especially if glucose 10 per cent is being given.

**300. General Preparation of Patients for Surgery.** Liquid or soft diet the night before; encourage the swallowing of fluids until four hours before surgery if not vomiting; shave and prepare the operative skin area; normal saline enema at 5:00 or 6:00 A.M.; lavage (if ordered) stomach cases; and take the temperature, pulse rate, and rate of respiration. Give hypodermic medication at the exact time ordered. (Morphine sulphate grains  $\frac{1}{6}$  and atropine sulphate grains  $\frac{1}{150}$  are usually given  $\frac{1}{2}$  hour before operation).

Have the patient void just before going to surgery. Measure the urine and chart. Report to the nurse or ward officer if the patient is unable to void. Catheterize if ordered.

Dress the patient in a clean gown and surgical legging. Comb the patient's hair. Put on his surgical cap. All artificial parts must be removed; this includes false teeth and dentures. Remove all jewelry and turn it over to the responsible officer. Fill out receipt and have the patient sign. Then return with valuables to the responsible officer for safe keeping.

Chart "Ready for surgery" and the time ready on patient's clinical record (Form 55, M.D.). When the patient leaves the surgery, chart the exact time that he leaves. Also chart the time patient returns from surgery.

**301. Surgical Preparations.** The object of pre-operative care is to prepare the patient for his operation.

*Articles necessary for the preparation tray.* Tray covered with a paper towel; razor and blades; toilet paper; bowl for water and a cake of soap; 3 cotton balls for lather; bowl for sterile water; forceps; solution as follows: green soap, ether, iodized alcohol (98 cubic centimeters of 70 per cent alcohol and 2 cubic centimeters of tincture of iodine); a preparation package in paper wrapper containing seven 4" x 4" gauze pieces and 3 applicators; newspaper for waste; and a drop light.

*Routine preparation.* Shave the area well. Do not cut or scratch the patient. Use soap to make lather.

*Surgical enema:* Take the patient to the enema room, if practicable. Give him a normal saline enema. Repeat at 6:30 A.M. the following day. Give sufficient water to get good results. Start the preparation for bath while the patient is expelling his enema.

*Tub bath:* Cleanse the bath tub well. Assist the patient in and out of the tub and as much as necessary. If the patient

has had a bath just before admission, get permission from the nurse or ward officer not to give a bath. When the patient has returned to his bed or in some cases to the operating room, paint the prepared field as follows.

Painting the prepared field (area of skin).

Green soap: Use applicator to clean the umbilicus (navel). Use forceps and one 4" x 4" gauze. Use up-and-down strokes from the median line to the bedline (line of the patient's body next to the bed). Lather three times, which will take about five minutes. Cleanse the area with sterile water. Use two pieces of 4" x 4" gauze, then dry well with two pieces of 4" x 4" gauze.

Ether: Use applicator to clean the umbilicus. Use forceps and one 4" x 4" gauze. Scrub with up-and-down strokes from median line to the bedline, alternating strokes on the right and left sides.

Iodized alcohol: Use applicator for the umbilicus. Use forceps and one 4" x 4" gauze. Paint with overlapping up-and-down strokes from median line to the bedline, alternating the strokes on the right and left side.

*Orthopedic preparation (two-day preparation).* First day: Same as the standard surgical preparation except scrub with green soap solution for 10 minutes; scrub with ether 3 minutes; paint with 3½ per cent iodine; remove all iodine with 90 per cent alcohol; cover the area with a double sterile cover (leggings or pillowcases may be used).

Second day: Omit shaving and green soap scrub; proceed as on the first day. When through, report to the ward officer and have him inspect the preparation.

*Emergency preparation.* Using a sharp blade, shave the area without using soap and water. Clean the umbilicus with an applicator. Scrub operative area with ether until sponges remain clean. Do not bathe unless ordered to do so. Do not give an enema unless ordered. When finished, report to the head nurse or ward officer and have the preparation inspected.

*Areas prepared for operations are:*

*Abdominal:* (appendectomy, cholecystectomy, gastric work, hernia, and any abdominal operation). Shave from the nipple line downward over genitalia, perineum, and anus. Shave from the median line out to the bedline, being careful of the hip bones.

*Bone surgery:* Operation on the wrist or area of the hand; shave the arm and hand from the fingertips to the elbow.

Operation on the elbow or area below: shave the arm from the wrist to the shoulder; include the armpit (axilla).

Operation above the elbow including shoulder: shave from the lower jaw to the waistline and from the spine to the anterior midline of the chest. Shave the shoulder and the arm down to the elbow, including the armpit.

Operation below the knee: shave from the knee downward, including the toes.

Operation on the knee: shave from the hip to the ankle.

Operation on the hip: shave from the waistline on affected side downward over the genitalia, perineum, and anus, and from the anterior midline to spine on the affected side. Shave the hip and the thigh downward to the knee.

*Mastoid operations.* On the affected side, part hair and clip with scissors, then shave an area six inches in diameter all around the ear and down the affected side of the neck to the clavicle (collar bone) in front and to the scapula (shoulder blade) in rear from the median line in front to the median line in back. Wash the ear carefully and swab the external canal with a soft applicator.

*Perineal operations.* Shave the genitalia and perineum and around the anus. Shave the thighs for several inches.

*Rectal operations.* Shave the genitalia and perineum and around the anus. Shave an area six inches in diameter around the anus.

*Neck operations* (thyroidectomy). Shave entirely around the neck from the lower jaw line and shoulders down to the nipple line in front.

**302. Post-operative Care.** Post-operative care begins when the patient returns from the operating room. Place him immediately in a well-warmed operative bed in a warm room with good ventilation but without draft. Do not leave him alone until he regains complete consciousness. Watch him so that he does not swallow his tongue, choke on aspirated mucus, or become chilled. If it is absolutely necessary to leave the room, place the side boards on the bed; preferably get some other attendant to take the duty.

Take the pulse rate and rate of respiration every 15 minutes for the first 2 hours, then every 30 minutes for 2 hours, and then every 2 hours for 4 hours. Record them as taken, noting the time.

When vomiting occurs, raise the head slightly and tilt it to the side. Place a kidney-shaped emesis basin under the jaw. Support the patient's head with one arm and hand and with the other hand wipe his mouth and face. Remove all mucus from his mouth, using squares of gauze.

Dry the face frequently during excessive perspiration. Also dry the skin and replace damp linen when it is safe to disturb the patient to that extent. Avoid exposing the body surface any more than actually necessary.

Do not give anything by mouth until ordered to do so by the medical officer in charge of the case. If fluids have been ordered by other methods check them to see that the apparatus is working. The nurse should not give intravenous infusions or hypodermoclysis. See par. 296 for description of drug administration.

**303. Complications.** When any of the following complications occur after surgery, report it promptly to the head nurse and ward officer:

Hemorrhage; collapse; excessive restlessness; drawn, anxious expression; gasping for air; blood-stained dressings or blood in stools, urine, or vomitus; cold clammy skin; weak pulse; unconsciousness; distension of the abdomen; and abnormal changes in the patient's temperature. The medical officer will wish to prescribe a treatment and control the care of these patients closely.

**304. Surgical Dressings.** There are various kinds of surgical dressings. The simplest is a *dry dressing* consisting of a

sterile gauze applied to the wound and held in place either by a roller bandage or adhesive plaster.

*Wet dressings* consist of gauze moistened with a prescribed solution and covered with a protective material to retain moisture and prevent wetting the bed and the patient. Hot, wet dressings are commonly used for local infections. They are applied in the form of sterile cotton pads wrapped with roller bandage and then covered with an oiled silk or rubber wrapping. Hot water bags are applied to maintain the heat. These are important dressings and to apply them correctly requires experience and training.

There are many other minor yet important surgical procedures that the trained nurse will know. The medical soldier should be constantly on the alert to learn new procedures in order that he may profit from the experience. All days are not alike in the surgical ward; therefore the nurse must be prepared for the care of emergencies at all times. Extra dressings, sterile instruments, clean linen, fresh beds, and individual rooms should be available at all times.

Surgical dressings will usually be applied by the medical officer, assisted by the nurse.

In the dressing of surgical wounds have all necessary equipment on the dressing tray. Most hospitals have a surgical cart on which dressings and equipment are kept. It is moved from one bedside to another and placed conveniently on the side the medical officer is working.

Dress all clean cases before dressing the patients having drainage (infectious cases). Remove adherent adhesive plaster with ether or benzine. If the gauze dressing is sticking to the skin, moisten it with a sterile solution of water. Where possible, remove all dressings with a forceps. Use clean, sterile forceps to replace the new dressings. Be certain that no contamination takes place. When there is doubt use another dressing.

When there is profuse drainage from a wound, the dressing should be changed frequently to prevent spread of the infection, uncleanness, unpleasant odors, and discomfort to the patient and other patients. Apply sterile vaseline to the skin adjacent to the wound.

Before starting dressings, the attendant should always scrub his hands thoroughly and rinse them with a disinfectant. He should do likewise upon completing this duty.

**305. Asepsis and Aseptic Technique.** It was not until 1850 that any great attention was paid to the cleansing of wounds, the discovery of the cause of infection, and how to treat infection.

*Bacteria.* Not all germs or bacteria are disease producers, but every precaution should be taken to destroy all germs, thus destroying the ones that might cause infection.

Bacteria are abundant in all parts and places of the earth. The air, the soil, the water, and every living animal have many millions of these small organisms. Fortunately, not all are disease producers and not all produce the same disease. But precautions must be taken in order that some diseases will not be produced when such overwhelming numbers of bacteria are present. Individual bacteria cannot be seen by

the human eye. It is known that bacteria can be collected in some of the most spotless of rooms and places, and they can be grown in great numbers under suitable environment.

The mouth, nose, teeth, and fingernails contain millions of bacteria, some of which will cause infection if allowed to break through the skin or protective surface. Breathing into an open wound or sore may cause it to become infected. Picking the skin with fingernails may distribute germs from the nails to the skin wound.

It is known that germs cause infections on the surface of the body as well as inside of the body. Discussion here is limited to wound infections outside the body. It is these wounds that can be cared for and treated in a simple manner.

A simple illustration of what takes place when infection of the skin is encountered follows: First, the outside protective layers of the skin are torn away (denuded) by a scratch. If the area denuded is deep enough the wound may bleed, or it may ooze serum if it is superficial. Bacteria present in the air, in the dirt, or bacteria already present on the skin invade this serum or blood and start multiplying. The blood and serum make good culture media (food) for most bacteria. Body resistance tries to kill these rapidly-forming bacteria, but if they are not killed the infection spreads and causes a more extensive area of disease. If the wound is properly treated in the earlier stages, the bacteria will be killed, or at least not allowed to multiply, and little or no infection will develop.

There are bacteria on all exposed objects, the skin of the body, in the mouth, and elsewhere. Obviously, the utmost care must be taken to remove the bacteria from the skin about a wound and then not introduce any thereafter. In surgery, the surgeons scrub their hands and forearms with soap and water for ten minutes by the clock. Then they dip their hands in iodine and sponge them off with alcohol. Even then the nails might contain bacteria, so rubber gloves are worn to insure further safety. Every precaution is taken to destroy the organism. The surgeon also wears a clean mask over his nose and mouth, a clean cap, and a sterile gown. The area or field of surgery to be operated is shaved beforehand to remove hiding places for bacteria and to make further cleansing easier. Ether is applied to the skin to remove oily substances, and then is followed by iodine and alcohol. Sterile drapes are applied around the operative area. The sheets of cloth (drapes) have beforehand been autoclaved, that is, heated to a high temperature, under pressure, in a tight oven (autoclave). The instruments to be used are rendered sterile (germ free) by boiling. Then during the operation the surgeon and his assistants do not touch anything but the sterile drapes, instruments, and the wound. Thus, surrounding bacteria have been previously killed, and no bacteria are brought into the wound. In this way all precautions are taken to guard against sepsis (infection).

It is known that from 50 to 70 per cent of all wounds will become infected (to more or less extent) if nothing is done to prevent infection. If every wound were to be cared for as soon as possible after it is caused, far fewer infections

would develop. Many severe infections have occurred from small, simple skin wounds that were overlooked or in which no attention or aid was given. Numerous arms and legs could have been saved if only the small wounds had been cared for at the start.

On encountering a wound the local facilities will vary the treatment. When in the field and aseptic technique is practicable, the wound should be bathed with plenty of water (and soap if available) and then some antiseptic applied. Every soldier and officer has a sealed metal packet containing a sterile dressing (first aid packet). On opening this dressing, handle it as little as possible and bind it with the gauze tails provided. Tuck in the edges to prevent the entry of perspiration and dirt from other parts of the body. Where ample facilities are available the process is the same, except when washing the wound a sterile gauze held by a sterile forcep is gently rubbed over the wound. The antiseptic is applied with a sterile piece of cotton on a sterile applicator (or stick). The gauze is handled with a sterile forcep. Dirty hands or even the ordinary washed hands should never come in contact with a wound.

Infected wounds are caused by bacteria. If every precaution can be used in the killing of these bacteria, or even the hindrance of their growth, the wound will heal properly and promptly. The secret is: start early to combat infection; treat every wound as potentially infected by thorough cleanliness and apply aseptic (the absence of germs or disease) technique.

## MATERIA MEDICA

**306. Materia Medica Defined.** *Materia medica* is the science which treats of the medicinal materials used for the cure or the prevention of disease. The particular part of this science which relates to the properties of medicinal substances and the application of remedial agents in the treatment of disease is known as *therapeutics*. These substances are usually spoken of as medicines or drugs. In studying them it is necessary to consider their source, composition, physical characteristics, chemical properties, preparation and administration, and physiological and toxicological action. In addition to the use of drugs as therapeutic agents, water, serums, vaccines, electricity, light rays, heat, physical, mechanical and operative measures, and hygienic agents are employed for the cure and prevention of disease.

**307. Derivation of Drugs.** Medicinal substances for the treatment of disease and the restoring or the preserving of health are derived from the animal, vegetable, and mineral kingdoms of nature. Samples of each are shown below:

*Animal.* *Adeps* (lard); *Adeps lanae* (wool fat); *Gelatinum* (gelatin); *Thyroideum* (thyroid); *Pepsinum* (pepsin); *Diphtherenicum* (antitoxinum).

*Vegetable.* *Amylum* (starch); *Acacia* (gum arabic); *Linum* (linseed); *Prunus virginiana* (wild cherry).

*Mineral.* *Sodii chloridum* (sodium chloride); *Sodii bicarbonas* (sodium bicarbonate); *Magnesii sulfas* (Epsom salts); *Magma magnesii* (milk of magnesia).

Medicinal substances obtained from the animal or vegetable kingdoms are called *organic drugs*. They contain compounds of carbon used in medicine.

Medicinal substances obtained from the mineral kingdom are called *inorganic drugs*.

**308. Administration of Medicines.** The normal adult dose of medicine is based upon the condition that the individual be 24 years of age and weigh approximately 150 pounds. Persons under 24 or over 60 years of age require proportionately smaller doses.

To compute the dose for persons under 24 years of age, the following rules are applicable.

*Young's rule:* Take the age of the person as the numerator of the fraction and the age plus 12 as the denominator. Thus for a child 4 years old, 4 would be the numerator and 4 plus

12, or 16, the denominator, or  $\frac{4}{4 + 12} = \frac{1}{4}$  of the adult dose.  
 $\frac{1}{4} \times 5 \text{ grains} = 1\frac{1}{4} \text{ grains}.$

*Cowling's rule:* Take the age at the next birthday of the individual as the numerator of the fraction and 24 (the age of the adult) as the denominator of the fraction. Thus for a child 11 years old, 12 would be the numerator and 24 the denominator, and the dose would be  $\frac{1}{2}$  of the average adult dose.  $\frac{1}{2} \times 5 \text{ grains} = 2\frac{1}{2} \text{ grains}.$

When the "dose" of a drug is designated, the meaning of

the term is the amount necessary to produce the desired therapeutic effect. The doses shown in the Pharmacopoeia and the National Formulary are the average therapeutic doses. The *lethal dose* is the smallest dose of the substance that will produce death. When giving medicines many factors affect the size of the dose, the method of administration, and the frequency of doses. Some of these factors are:

*Age.* Children and aged adults as a rule require less than the normal adult dose.

*Sex.* Females require smaller doses than males.

*Race.* Negroes usually require larger and Asiatics smaller doses than white people.

*Physical condition.* Strong, sturdy patients require larger doses than weak patients.

*Climate.* People in warm climates, as a rule, require smaller doses of purgatives.

*Occupation.* Men working out of doors at hard labor require larger doses than those who sit at a desk during the working day.

*Habitual use.* If the individual has become a habitué, this modifies the dose by lessening the therapeutic effect of the drug, and the dose of the drug must be increased greatly to obtain the proper effect. This is especially true of narcotics.

*Idiosyncrasy.* People react differently to drugs if they happen to have a peculiarity of constitution, and occasionally these individuals are encountered. Patients will usually inform medical authorities of difficulties encountered when the drug was administered previously.

*Form of the drug.* All drugs must be reduced to a solution before they enter the blood circulation. The form of the drug will control largely the rate of absorption.

*Time of administration.* Drugs given before a meal are more quickly absorbed than those given upon a full stomach.

*Mode of administration.* As a rule, drugs administered hypodermically are used in much smaller quantities. Drugs may be introduced into the circulation by any one of the following methods:

*By mouth.* Most common of all methods and is usually the most desirable except when rapid action is required.

*Subcutaneously.* Drugs are injected under the skin. This method is frequently used when rapid action is desired or when the stomach juices will destroy the principal action of the drug if given by mouth.

*By rectum.* Introducing the drug into the rectum either by suppository or by means of a solution, when it is impossible to administer drugs by mouth because of vomiting, semi-consciousness or unconsciousness, delirium, or certain diseases of the gastrointestinal tract.

*By inunction.* This method consists of applying ointments or oily combinations to the skin and rubbing them into it.

*Intravenously.* By this means preparations of drugs are introduced directly into a vein. It is used when rapid action is desired.

*Inhalation.* By this method medicated vapors or drugs, such as ether or chloroform, are inhaled.

*Hypodermoclysis.* Hypodermoclysis is the introduction of

solutions of saline into the loose tissues about the breasts, abdomen, and certain other portions of the body.

*Intramuscularly.* By this method sterile preparations of drugs which are readily absorbable are injected directly into the muscle tissue.

Further information as to administration of medicines is given in Chapter 18.

**309. Classification of Drugs.** Drugs are classified according to their physiological actions and effects on the body or its organs and tissues. If a drug (therapeutic agent) increases the functional activity of the body or of any organ or tissue, it is a *stimulant*; if it lessens or reduces the functional activity, it is a *sedative*. Below is a list of some of the common terms classifying drugs according to their actions and effects. Examples of remedial agents are shown for each. A drug may have more than one action or effect and will therefore be included in corresponding classes. For the description and average dose of common individual drugs, see par. 310.

*Alteratives.* Substances used to modify processes of nutrition, especially in chronic diseases. Examples: Donovan's solution, arsenic and mercuric iodides, calomel, sodium cacodylate, hydriodic acid diluted, arsenic trioxide, tincture of iodine.

*Analgesics or anodynes.* Used to allay pain. Examples: acetylsalicylic acid (aspirin), paragoric, acetophenetidin, acetanilid, ammonium salicylate, antipyrine.

*Anesthetics.* Used to produce local or general insensibility. Examples: ether, chloroform, nitrous oxide, ethylene, ethyl chloride, cocaine, novacaine, butyn, phenol.

*Anaphrodisiacs.* Used to depress the sexual appetite and function. Examples: potassium nitrate (saltpetre), potassium iodide.

*Antacids.* Used to neutralize acid in the stomach and intestine. Examples: sodium bicarbonate, bismuth subcarbonate, magnesium phosphate, magnesium oxide, magnesium carbonate, calcium carbonate, potassium bicarbonate.

*Anthelmintics.* Used to destroy or expel intestinal worms. Examples: santonin, carbon tetrachloride, tetrachlorethylene, thymol, oil of chenopodium.

*Antidotes.* Act upon poisons in such a manner as to alter their composition, rendering them less poisonous and so preventing their toxic (poisonous) action from being exerted upon the body. Examples: tannic acid (abundant in tea) to most of the vegetable poisons; milk and albumen of egg to mineral poisons.

*Antipyretics.* Used in the reduction of body temperature in fevers. Examples: antipyrine, acetanilid, phenacetine, amidopyrine, acetylsalicylic acid (aspirin), quinine sulphate.

*Antiseptics.* Have the power of preventing the growth and development of bacteria. Examples: alcohol, phenol, potassium permanganate, free chlorine (such as from fresh Dakin's solution), sodium perborate, hydrogen peroxide, silver nitrate, boric acid, tincture of iodine, mercurochrome, mercury bichloride, sulphur, sodium thiosulphate, formaldehyde, iodoform.

*Antispasmodics.* Used for the relief of nervous irritability

and minor spasms. Examples: atropine sulphate, camphor, valeriana, asafetida.

*Antisymphilitics.* Used in the treatment of syphilis. Examples: arsphenamine, neoarsphenamine, tryparsamide, sulpharsphenamine, bismuth subsalicylate, mercurial ointment, mercury salicylate, potassium iodide.

*Astringents.* Produce shrinkage of the mucous membranes or raw tissues, decreasing the amount of exudation from them. Examples: tannic acid, silver nitrate, ferric chloride, ferric subsulfate, potassium permanganate, bismuth subcarbonate, alum, boric acid, bismuth subgallate, resorcinol, calcium hydroxide.

*Cardiac stimulants.* Used to increase the force and frequency of the heart action. Examples: digitalis, adrenalin, ephedrine, strophanthin, metrazol, caffeine.

*Carminatives.* Aid in the expulsion of gas from the stomach and intestine by increasing peristalsis, stimulating circulation, etc. Examples: anise, asafetida, capsicum, cardamon, cloves, ginger nutmeg, peppermint, pimenta, sassafras, spearmint, oil of turpentine.

*Cathartics.* Increase or hasten the evacuation of the intestine. They are classified according to their power, as follows: laxatives or aperients, simple purgatives, drastic purgatives, saline purgatives, hydrogogues, cholagogues. Examples respectively are cascara sagrada, castor oil, croton oil, magnesium sulphate, resin jalap, and bile salts.

*Caustics.* Destroy the tissue to which they are applied and produce a slough. Examples: silver nitrate, trichloroacetic acid, monochloroacetic acid, nitric acid, chromium trioxide, copper sulfate, zinc chloride, trioxymethylene.

*Correctives.* Used to correct or render more pleasant the action of other remedies, especially purgatives. Examples: fruit extracts, soda bicarbonate, oils of anise, caraway, cloves, and peppermint.

*Demulcents.* Allay irritation and soothe and protect the parts to which they are applied. Examples: flaxseed, acacia, tragacanth, slippery elm, marshmallow, glycyrrhiza (licorice root), almond, starch, glycerin.

*Deodorants.* Destroy or hide foul odors. Examples: formaldehyde, sulphur dioxide, creosote, naphthalin, lime, zinc chloride, potassium permanganate, charcoal, bromine, chlorine, phenol, blue or green vitriol.

*Diaphoretics.* Produce increased excretion of sweat. Examples: pilocarpine, eserine, muscarine, ammonium salts, picrotoxin camphor.

*Disinfectants.* Have the power of destroying germs. Examples: heat in various forms, light in various forms, phenol, alcohol 70 per cent, formaldehyde, mercuric chloride, chlorine, creosote solutions, acriflavine, metaphin, silver nitrate.

*Diuretics.* Increase the secretion of the urine. Examples: caffeine, oil of juniper, sweet spirit of nitre.

*Emetics.* Produce vomiting. Examples: apomorphine and ipecac.

*Haemostatics.* Arrest hemorrhages (usually applied to internal bleeding). Examples: tannin, epinephrine, pituitrin, chromium trioxide.

*Hypnotics.* In the proper doses, produce sleep without narcotic or deliriant effects. Examples: phenobarbital, sulphonal, bromides.

*Irritants.* When applied to the skin, produce more or less vascular excitement. When employed to excite a reflex influence on a part remote from the place of application they are called counter-irritants. Rubefacients, the mildest of this group, cause redness (congestion) of the skin. Vesicants or blistering agents produce decided inflammation of the skin and the accumulation of serum between the epidermis and the derma. Examples: rubefacients—mustard, capsicum, camphor, ammonia, arnica, alcohol, ether, chloroform, tincture of iodine, oil of turpentine, menthol. Vesicants—cantharides, iodine, ammonia, mustard oil in alcohol, boiling water, glacial acetic acid, formic acid in water.

*Mydriatics.* Cause dilation of the pupil. Examples: atropine sulfate, homatropine hydrobromide, cocaine, gelsemium.

*Myotics.* Cause contraction of the pupil. Examples: eserine salicylate, pilocarpine nitrate.

*Narcotics.* Used to depress the central nervous system. Narcotics are more powerful than soporifics and produce a more profound depression from which one cannot be aroused. If the dose is sufficient they produce coma, insensibility, and death by paralysis of the nerve centers which control organic life. Examples: morphine sulphate, codeine sulphate, chloral hydrate, opium, dilaudid hydrochloride.

*Nutrients.* Give nourishment to the system. Examples: glucose, lactose, viosterol and other vitamin containing substances, olive oil, oil of almond.

*Parasiticides.* Destroy the various animal and vegetable parasites. Examples: mercury oxide (red), mercury bichloride, ammoniated mercury ointment, mercury salicylate, sulfurous acid, betanaphthol, chrysarobin, sulphur, hydrocyanic acid, oil of tar.

*Prophylactics.* Prevent the taking or the development of disease. Examples: serums, vaccines, protein silver.

*Pulmonary sedatives.* Relieve cough and dyspnoea (difficult breathing) by lessening the irritability of either the respiratory center or the nerves of respiration. Examples: codeine sulphate, morphine sulphate, papaverine hydrochloride, paraldehyde, terpin hydrate.

*Purgatives.* Produce free evacuation of the bowels. See cathartics.

*Respiratory stimulants.* Intensify the function of the respiratory center in the medulla oblongata, quickening and deepening the breathing. Examples: alpha lobelin, caffeine, atropine in large doses, metrazol, strychnine.

*Soporifics.* Sleep producing but less powerful than narcotics. Examples: sodium bromide, potassium bromide, phenobarbital, barbitol, Dover's powder, dilaudid hydrochloride in small doses.

*Specifics.* Have a direct curative influence on certain diseases. Examples: insulin for diabetes mellitus, thiamine hydrochloride (Vitamin B<sub>1</sub>) for beriberi, nicotinic acid for pellagra.

**Styptics.** Control minor hemorrhages by local hemostasis. Examples: stypticin, alum, tannic acid, iron sulphate, zinc sulphate.

**Tonics.** Augment gradually and permanently the strength and vital activity of the body or its organs, increasing the vigor of the entire system. Examples: iron carbonate, nuxvomica, cod liver oil, quinine, rhubarb, syrup of iron iodide.

**Vermifuges.** Cause the expulsion of intestinal worms. See anthelmintics.

**310. Description of Commonly-Used Drugs.** For immediate reference to some of the drugs used commonly in the Army hospital, a brief description of the source, composition, physical characteristics, chemical properties, preparation and administration (average dose), and physiological and toxicological (poisonous) action of each of them is included in alphabetical order below. The soldier engaged in active pharmacy will have need to seek more complete description of these and other drugs as found in the *United States Pharmacopoeia*.

**Acetylsalicylic acid (aspirin), U.S.P.** The acetyl derivative of salicylic acid. Preserve it in well-closed containers.

**Properties:** It is a white crystalline powder or colorless crystals, odorless, and stable in dry air. It is sparingly soluble in water and freely soluble in alcohol. In moist air gradually hydrolyzes into acetic and salicylic acids. It is decomposed by alkalis.

**Action and uses:** It is used extensively as an antipyretic and antirheumatic. It is an excellent headache remedy. It must be used with caution because some individuals are easily poisoned by it, due probably to an idiosyncrasy. It should not be dispensed in solution because its aqueous solution slowly decomposes on standing.

**Average dose:** 0.3 gram or 5 grains.

**Alcohols.** Alcohols are compounds formed by the replacement of one or more hydrogen atoms of a paraffin hydrocarbon with an equal number of hydroxyl (OH) groups. If one hydroxyl group is substituted for one hydrogen atom in methane (CH<sub>4</sub>) an alcohol known as methanol (CH<sub>3</sub>OH) (methyl or wood alcohol) results; if one hydroxyl group is substituted for one hydrogen atom in ethane (C<sub>2</sub>H<sub>6</sub>) an alcohol known as ethanol (C<sub>2</sub>H<sub>5</sub>OH) (ethyl or grain alcohol) is obtained; if three hydroxyl groups are substituted for three hydrogen atoms in propane (C<sub>3</sub>H<sub>8</sub>) an alcohol known as glycerol (C<sub>3</sub>H<sub>7</sub>(OH)<sub>3</sub>) (glyceric alcohol or glycerin) occurs. When acted upon by an acid they form a salt (ester) and water which is analogous to the reaction that takes place when an acid acts on a base (hydroxide). They have a neutral reaction to litmus if pure.

**Ammonia water, stronger U.S.P.** An aqueous solution of ammonia (NH<sub>3</sub>) containing not less than 27 per cent nor more than 29 per cent by weight of NH<sub>3</sub>. This solution deteriorates rapidly in open containers. Preserve it in a cool place in glass-stoppered or rubber-stoppered bottles made of hard glass, free from lead. Great caution should be used in handling this liquid because of its caustic and irritating properties, and it must never be tasted or smelled unless greatly diluted.

**Properties:** It has an excessively pungent, characteristic odor and a caustic and alkaline taste. In its chemical properties it closely resembles the solutions of potassium or sodium hydroxide, being a strong, caustic alkali. If kept in a warm place, ammonia (NH<sub>3</sub>) is liberated and held in the upper part of the bottle; therefore, great care should be exercised in opening the bottle to see if the stopper has been secure and has not allowed the gas to escape. There is danger of the sudden escape of a large amount of gas, which might cause injury to the eyes or mucous membranes of the nose and throat by inhalation.

**Preparation:** Ammonia is a by-product in the manufacture of illuminating gas. When coal is subjected to destructive distillation, ammonia is one of the products formed. The gases formed are passed through an acid solution (sulfuric or hydrochloric) and an ammonium salt is formed (ammonium sulfate or chloride, ac-

(ording to the acid used). This salt then is heated with lime, ammonia ( $\text{NH}_3$ ) is set free, and after passing it through quicklime it is passed into water until a saturated solution is formed.

**Action and uses:** Stronger ammonia water is never given internally. It is used in making the weaker solution of ammonia, known as ammonia water. Ammonia water is an aqueous solution of ammonia ( $\text{NH}_3$ ), containing not less than 9.0 grams nor more than 10.0 grams of  $\text{NH}_3$  in each 100 cc. This solution is used in making aromatic spirit of ammonia and ammonia liniment. The antidote for ammonia water is weak acids, the same as for other alkaline hydroxides. Inhalations of ammonia gas stimulate the heart and respiratory center. Oedema of the glottis, resulting in obstructed breathing, might result in giving inhalations of concentrated ammonia gas; therefore, care should be exercised in giving inhalations to an unconscious patient.

**Aromatic spirit of ammonia, U.S.P.** It contains, in each 100 cc., not less than 1.7 grams and not more than 2.1 grams of total  $\text{NH}_3$ ; and ammonium carbonate, corresponding to not less than 3.5 grams and not more than 4.5 grams as  $(\text{NH}_4)_2\text{CO}_3$ , (ammonium carbonate). Preserve it in glass stoppered bottles, in a cool place and protected from light.

**Description:** A nearly colorless liquid when freshly prepared but gradually acquiring a yellow color on standing. It has the taste of ammonia and an aromatic and pungent odor.

**Action and uses:** It is used as a reflex stimulant to prevent fainting, and to relieve nausea or sick headache caused by hyperacidity of the gastric juice. It should be given well diluted with water. It contains from 62 to 68 per cent of alcohol.

**Average dose:** 2 cc. or 30 minims.

**Arsphenamine, U.S.P.** Also known as salvarsan, 606, arsenobenzol, and arsaminol. Contains not less than 30 per cent of arsenic (As). Its manufacture is under the control of the U. S. Public Health Service.

**Properties:** A light yellow, hygroscopic powder, unstable in air, and put up in sealed ampules.

**Action and uses:** A specific remedy for syphilis in all stages, but it is more efficient the more recent the infection; also useful in various spirillum diseases, such as relapsing fever, Vincent's angina, etc.

**Average dose:** 0.3 to 0.6 gram or 5 to 9 grains, administered intravenously.

**Atropine sulfate, U.S.P.** The sulfate of the alkaloid atropine.

**Properties:** It occurs as a white, crystalline powder or colorless crystals efflorescent in dry air. Great caution should be used in tasting it and then only in very dilute solution. It is soluble in 0.4 part of water, and 5 parts of alcohol.

**Action and uses:** It is used in 0.5 per cent solution to dilate the pupil of the eye. **Caution:** It is an extremely poisonous drug.

**Average dose:** 0.0005 gram or 1/120 grain.

**Barbital (diethylbarbituric acid), U.S.P.**

**Properties:** Colorless or white crystals, or a white crystalline powder, odorless, with a slightly bitter taste, and stable in the air. It is soluble in 130 parts of water, and in 14 parts of alcohol. A saturated solution in water is acid to litmus paper.

**Action and uses:** It induces sleep and is a relatively safe hypnotic. A large number of deaths have resulted from its use, due to a single overdose or continuous administrations of small doses.

**Average dose:** 0.3 gram or 5 grains.

**Bismuth subcarbonate (basic bismuth carbonate), U.S.P.** It is a basic salt, which, when dried to constant weight at  $100^\circ \text{C}$ ., yields upon ignition not less than 90 per cent of  $\text{Bi}_2\text{O}_3$ . Protect it from the light in well-closed containers.

**Properties:** A white or pale yellowish-white powder. It is odorless and tasteless and is stable in the air. It is insoluble in water and in alcohol.

**Action and uses:** It is protective, slightly antiseptic, astringent, and antacid. It is used in the treatment of hyperacidity of the stomach and in the treatment of ulcers of the stomach and intestine. It is used in making X-ray pictures of the intestinal tract. It is less toxic than the subnitrate and may be given in larger doses with greater safety. It is used as an antiseptic and protective application in the treatment of skin diseases, old ulcers,

and suppurating wounds. Its external application to the broken skin must be watched for possible toxic symptoms due to absorption of the drug.

Average dose: 1 gram or 15 grains.

**Boric acid (boracic acid),  $H_3BO_3$ , U.S.P.** Boric acid contains not less than 99.5 per cent of  $H_3BO_3$ . Preserve it in well-closed containers.

**Properties:** Colorless scales of a pearly luster, or crystals, or a white powder, slightly unctuous to the touch. It is odorless and is stable in the air. One gram is soluble in 18 cc. of water, and in 18 cc. of alcohol, and in 4 cc. of glycerin. An aqueous solution is slightly acid to litmus paper.

**Action and uses:** Boric acid is a mild antiseptic. Externally it is used as a dusting powder either alone or with diluents such as starch or talcum. An aqueous solution containing from 2 to 4 per cent is used as an eye lotion. Boric acid solution has caused death in infants when given internally by mistake.

Average dose: 0.5 gram or 8 grains.

**Cascara sagrada aromatic fluid extract, U.S.P.** Made by extracting the active principles of cascara sagrada with boiling water. The bitter taste is removed from the cascara by maceration and percolation while it is mixed with magnesium oxide. It is aromatized and sweetened with purse extract of glycyrrhiza, saccharin, oil of anise, oil of coriander, and methyl salicylate. It contains from 17 to 19 per cent alcohol.

**Action and uses:** It is preferred as a laxative over the other preparation of cascara because of its pleasant taste.

Average dose: 2 cc. or 30 minims.

**Castor oil, U.S.P.** A fixed oil obtained from the seeds of *Ricinus communis*. Preserve it in well-closed containers.

**Properties:** It is a pale-yellowish or almost colorless, transparent, viscid liquid, having a faint, mild odor and a bland, afterwards, slightly acrid and generally nauseating taste. It is almost insoluble in water and is soluble in equal parts of alcohol and in one and one-half times its volume of liquid petrolatum.

**Action and uses:** It is used extensively as a simple purgative. It increases the intestinal secretions and stimulates the peristaltic movements of the intestine. Its disagreeable taste may be disguised partially by administering it between a layer of peppermint water below and a layer of compound tincture of cardamon above the oil.

Average dose: 15 cc. or 4 fluid drams.

**Codeine sulfate, U.S.P.** The sulfate of the alkaloid codeine. Preserve it in well-closed containers, protected from light.

**Properties:** It occurs in colorless crystals, usually needlelike, or as a white crystalline power, efflorescent in the air. It is soluble in 30 parts of water and slightly soluble in alcohol.

**Actions and uses:** Sedation, narcotic, especially in respiratory diseases.

Average dose: 0.03 gram or  $\frac{1}{2}$  grain.

**Cod liver oil, U.S.P.** The partially destearinated fixed oil obtained from the fresh livers of *Gadus morrhua* (codfish) and other species of the family *Gadidae*. Cod liver oil contains in each gram at least 600 U.S.P. units of vitamin A and at least 85 U.S.P. units of vitamin D. Preserve it in a cool place in well-closed containers which have been thoroughly dried before filling.

**Properties:** It is a thin, oily liquid, having a peculiar, slightly fishy, but not rancid odor, and a fishy taste. It is almost insoluble in water but is slightly soluble in alcohol.

**Preparation:** The oil is obtained from the fresh fish livers by boiling them with water and skimming off the separated oil.

**Action and uses:** It is used as a tonic in the treatment of wasting diseases. The ease with which it is assimilated makes it an excellent food. Its beneficial effects are due principally to the presence of large amounts of vitamin A and vitamin D. Cod liver oil is also used as a local application to promote healing of burns on the body.

Average dose: 10 cc. or  $2\frac{1}{2}$  fluid drams.

**Digitalis (foxglove), U.S.P.** The dried leaf of *Digitalis purpurea*. The potency of digitalis shall be such that 0.1 gram of it, when assayed as directed, shall possess an activity equivalent to not

less than 1 U.S.P. digitalis unit. One United States Pharmacopoeial Digitalis Unit is identical in potency with the International Digitalis Unit, as adopted in 1928 by the Permanent Commission on Biological Standardization of the Health Organization of the League of Nations. One International Digitalis Unit represents the activity of 0.1 gram of the "International Standard Digitalis Powder." Digitalis contains a number of glucosides, those of the greatest importance being digitalin, digitonin, digitalein, and digitoxin. There are many proprietary preparations of digitalis on the market, but the U.S.P. recognizes only two, powdered digitalis and tincture of digitalis. Tincture of digitalis is on the Supply Table. The potency of powdered digitalis is the same as digitalis; when digitalis is prescribed, powdered digitalis should be dispensed. Digitalis should be stored in waterproof and airtight containers and be protected from light.

**Action and uses:** It is used as a cardiac tonic and stimulant, slowing and strengthening the heart beat. Digitalis is cumulative in the system. Evidence of accumulation is shown by headache, giddiness, sickness, and a marked slowing of the pulse. The active principles of digitalis are irritating to the gastric mucous membranes and may cause nausea and vomiting. In case of mild poisoning or overdosing administer atropine sulfate hypodermically. The diuretic effect of digitalis is due to improved circulation.

**Average dose:** 0.1 gram or  $1\frac{1}{2}$  grains.

**Ephedrine, U.S.P.** An alkaloid obtained from *Ephedra equisetina*, *Ephedra sinica*, and other species of *Ephedra*. It was first obtained from a Chinese herb. It is closely related to epinephrine structurally but is more stable.

**Properties:** An unctuous, almost colorless solid, or white to colorless crystals or granules. It is soluble in water, in alcohol, in chloroform, in ether, and in liquid petrolatum, the latter being turbid if the ephedrine is not dry. Solutions of ephedrine are strongly alkaline to moistened red litmus paper.

**Action and uses:** Ephedrine produces effects similar to those produced by epinephrine (adrenalin). It increases blood pressure and causes dilation of the bronchi and of the pupils of the eyes. It is used for shrinking congested nasal mucous membranes in rhinitis and sinusitis. It is also given in the treatment of asthma and hay fever. It may be given by mouth, hypodermically, or intramuscularly. The base (ephedrine) is used in ephedrine oil inhalant (usually 1 to 3 per cent in liquid petrolatum). The hydrochloride and sulfate are used in water solution. The sulfate is used in ephedrine jelly and in ephedrine syrup. The salts are not soluble in liquid petrolatum and cannot be used in the preparation of the oil inhalants.

**Average dose:** 0.025 gram or  $\frac{3}{8}$  grain.

**Ethers.** Ethers may be defined as oxides of hydrocarbon radicals. There are simple ethers and mixed ethers. Simple ethers are formed by the union of two like hydrocarbon radicals with one oxygen atom; compound ethers are formed by the union of two unlike hydrocarbon radicals with one oxygen atom. Ethers in organic chemistry are analogous to oxides in inorganic chemistry. The term often is applied erroneously to esters. It should be understood clearly that ethers and esters are two different and distinct classes of organic compounds. Ethers are organic oxides, while esters are organic salts.

**Glucose (syrupy glucose, liquid glucose, corn syrup), U.S.P.** A product obtained by the incomplete hydrolysis of starch. The syrupy glucose obtained by one process of manufacture consists of 30 to 40 per cent of dextrose, 30 to 40 per cent of dextrin, and small amounts of other carbohydrates, notably maltose, and water.

**Properties:** A colorless or yellowish, thick, syrupy liquid, odorless or nearly so, and having a sweet taste. It is soluble in water but only sparingly soluble in alcohol. It is the principal source of dextrose, U.S.P. The term "glucose" is frequently applied incorrectly to dextrose but should never be used when reference to dextrose is intended.

**Action and uses:** Glucose is given per rectum as a food when feeding by stomach is impossible, and it may be used to combat various types of shock. In pharmacy it is used as a diluent in pillular extracts and has replaced glycerin in the commercial manufacture of many pharmaceutical preparations. If the U.S.P. prep-

aration of glucose is not available, ordinary commercial corn syrup is a satisfactory substitute.

Glucose should not be given intravenously, intramuscularly, or intra-abdominally, as it contains substances not suitable for introduction into the body in those ways. It should not be used if dextrose is obtainable.

**Hydrochloric acid, HCl, U.S.P.** An aqueous solution containing not less than 35 per cent nor more than 37 per cent of HCl. Preserve it in glass-stoppered bottles. It should be noted that about 64 per cent of the liquid is water and only 36 per cent (by weight) is hydrochloric acid (gas). Absolute HCl is a gas, and this preparation is a solution of HCl gas in water.

**Preparation:** It is made by acting on sodium chloride (common salt) with sulfuric acid.

**Neocarsphenamine (neosalvarsan), U.S.P.** The name applied to a mixture, sodiumdiaminodihydroxyarsenobenzenemethanolsulfoxylate with inert, inorganic salts. It contains not less than 19 nor more than 22 per cent of arsenic (As) and complies with the requirements of the National Institute of Health, U. S. Public Health Service. Preserve it in sealed tubes of colorless glass, from which the air has been excluded either by the production of a vacuum or by displacement with a nonoxidizing gas, in a cool place, preferably not above 10° C.

**Properties:** A yellow powder, unstable in air.

**Action and uses:** Essentially the same as those of arsphenamine, although many observers claim better results. It differs from arsphenamine in that it dissolves readily in sterile water, making a neutral solution which can at once be injected. Water not warmer than from 20° to 22° C. (68° to 71.6° F) should be used in dissolving the drug, and the injections should be made at once, as it oxidizes rapidly and becomes toxic. The solution should not be shaken, and it must not be administered subcutaneously.

**Average dose:** 0.6 to 0.9 gram or 9 to 14 grains.

**Camphorated tincture of opium (paregoric), U.S.P.** It is made of 40 cc. of tincture of opium, 4 cc. of oil of anise, 4 gm. of benzoic acid, and 4 gm. of camphor dissolved in 900 cc. of diluted alcohol to which 40 cc. of glycerin and sufficient diluted alcohol are added to make the finished product measure 1000 cc. It is the weakest and one of the most used of the opium preparations and yields, from each 100 cc., not less than 0.035 gram and not more than 0.045 gram of anhydrous morphine.

**Action and uses:** It possesses analgesic and carminative properties. It is one of the ingredients in Brown's Mixture (checks cough). It is used to relieve abdominal pain due to flatus (gas in the intestine), to check diarrhoea, etc.

**Average dose:** 4 cc. or 1 fluid dram.

**Petrolatum (petroleum jelly), U.S.P.** A purified mixture of semi-solid hydrocarbons, obtained from petroleum.

**Properties:** It is an unctuous mass, yellowish to light amber in color, transparent in thin layers, and free from odor and taste. It is insoluble in water, almost insoluble in alcohol, soluble in ether, chloroform, oil of turpentine, benzine, or in most fixed or volatile oils. It melts between 38° and 54° C. Chemically it is very stable and does not turn rancid like vegetable oils and animal fats. It remains unchanged when brought in contact with strong acids or alkalis.

**Preparation:** It is an intermediate product in the distillation of crude petroleum. It comprises a part of the residue left after distillation of the lighter substances.

**Action and uses:** It is used as a bland, neutral, protective dressing and as a base for ointments. The absorption and rapidity of action of drugs are retarded when incorporated with petrolatum; therefore, it should not be used alone as an ointment base when absorption of a drug is desired. Given internally it is not absorbed from the intestinal tract; it acts as a lubricant and may be used in gastrointestinal irritation. White petrolatum, U.S.P., is petrolatum that has been decolorized.

**Phenobarbital (luminal), U.S.P.** This compound is closely related chemically to barbitol in that it represents barbitol with an ethyl group replaced by a phenyl group.

**Properties:** White, glistening, small crystals or a white crystalline powder, odorless, and stable in the air. It is soluble in 1000

parts of water, and in 8 parts of alcohol. A saturated aqueous solution is acid to litmus paper.

**Action and uses:** It is used as a sedative and hypnotic. The action is similar to that of barbital but more powerful. It is poisonous in large doses.

**Average dose:** 0.03 gram or  $\frac{1}{2}$  grain.

**Phenol (carbolic acid),  $C_6H_5OH$ , U.S.P.** It is obtained from coal tar or made synthetically. It contains not less than 98 per cent of  $C_6H_5OH$ . Preserve it in well-closed containers, protected from light.

**Properties:** It occurs as colorless, interlaced or separate needle-shaped crystals, or as a white, crystalline mass, sometimes acquiring a red tint, having a characteristic, somewhat aromatic odor. When undiluted it cauterizes and whitens the skin and mucous membrane. It is soluble in 15 parts of water; soluble in alcohol, glycerin, chloroform, ether, and in fixed or volatile oils. When heated it melts, forming a highly refractive liquid. It also is liquified by the addition of about 8 per cent of water.

**Preparation:** It is obtained from coal tar by fractional distillation and subsequent purification. It also is made synthetically.

**Action and uses:** Liquified phenol is used as: antiseptic, germicide, disinfectant, caustic or local anesthetic.

**Potassium permanganate,  $KMnO_4$ , U.S.P.** It contains, when dried to constant weight in a desiccator over sulfuric acid, not less than 99 per cent of  $KMnO_4$ . Preserve it in glass-stoppered bottles. Potassium permanganate when in solution or in the dry condition must not be brought into contact with organic or other readily oxidizable substances, as dangerous explosions are liable to occur.

**Properties:** It occurs as slender prisms, of a dark purple color, odorless and having a disagreeable astringent taste. It is stable in the air. It is soluble in 14.2 parts of water. An alcoholic solution cannot be made because it is decomposed by alcohol. It is a powerful oxidizing agent, two molecules in acid solution yielding five atoms of oxygen. When it comes in contact with organic matter it is decomposed with the liberation of oxygen. This property makes it a valuable antiseptic and disinfectant.

**Preparation:** It may be made by fusing together a mixture of potassium hydroxide, manganese dioxide, and potassium chlorate, forming potassium manganate. When the potassium manganate is boiled with water, potassium permanganate is formed.

**Action and uses:** It is used as an antiseptic astringent irrigating fluid, especially for the urethra and bladder, in strengths of from 1-4000 to 1-10,000. It seldom is used externally, largely on account of the objectionable stain which it leaves. A 5 per cent solution is used in the treatment of poisoning by venomous snakes by injection into the wound. It also is used in the treatment of morphine poisoning. It has been used with formaldehyde solution to volatilize formaldehyde gas in disinfection of rooms, but it has been displaced for this purpose by barium dioxide, a cheaper substance.

**Average dose:** 0.06 gram or 1 grain.

**Insulin, N. N. R. (new and nonofficial remedies).** An aqueous solution of an active principle from the pancreas which affects sugar metabolism. The strength of insulin is expressed in "units." The unit is equivalent to 0.125 milligrams of the International Standard Preparation of Dry Insulin Hydrochloride prepared by the Medical Council of Great Britain. One milligram of this standard preparation contains 8 insulin units, as provisionally defined by the Insulin Commission of the University of Toronto, Canada.

**Action and uses:** It is used in the treatment of diabetes. If a suitable dose of insulin is administered at suitable intervals to a person suffering from diabetes mellitus, the blood sugar is maintained at or near a normal level and the urine remains free from sugar. In case of overdosing with insulin the patient complains of weakness and fatigue and a feeling of nervousness and tremulousness, followed by profuse sweating. This condition is relieved by giving orange juice by mouth, or dextrose intravenously if the patient is comatose. Insulin is administered by injection into the loose subcutaneous tissue of the body about 30 minutes before meals. There is no average dose for insulin; each case must be studied individually. The dose of insulin should always be expressed in units rather than by cubic centimeters.

**Iodine, I, U.S.P.** Iodine contains not less than 99.5 per cent of I. Preserve iodine in glass bottles closed with stoppers resistant to corrosion, and in a cool place, protected from light.

**Properties:** Heavy, grayish-black, brittle plates, having a metallic luster and a characteristic odor. One gram is soluble in 2950 cc. of water, in 12.5 cc. of alcohol, in 80 cc. of glycerin, and in 4 cc. of carbon disulfide. It is freely soluble in chloroform, in carbon tetrachloride, and in ether, and is dissolved by aqueous solutions of iodides. Iodine unites actively with iron and other metals. In weighing iodine use a bone or rubber spatula, and paraffined paper on the scale pans. With starch paste, iodine gives a deep blue color. Iodine stains may be removed from linen by the application of a solution of sodium thiosulfate.

**Source:** Iodine is now obtained principally from the mother liquors obtained in the purification of crude Chili saltpeter (sodium nitrate). Some iodine is obtained from the ashes obtained by burning seaweeds. A new source of iodine is the brine issuing from the oil in petroleum oilwells. In Chili saltpeter, iodine occurs as sodium iodate mixed with sodium nitrate.

**Action and uses:** See tinctures of iodine. The antidote is starch paste.

**Average dose:** 0.01 gram or 1/6 grain.

**Lard, U.S.P.** The purified internal fat of the abdomen of the hog. Preserve it in a cool place in well-closed containers which are impervious to fat. **Adeps benzoïnatus** (benzoïnated lard), U.S.P., is a lard that has been treated with Siam benzoïn to prevent it from turning rancid. In the preparation of benzoïnated lard for use in warm climates the Pharmacopœia states that 50 grams of white wax (or more if necessary) may replace an equal amount of the lard in order to raise its melting point. Supply Table lard contains 12 per cent of white wax.

**Properties:** Lard is a soft, unctuous mass having a faint odor and a bland taste, and free from rancidity. It melts between 36° and 42° C., is insoluble in water, slightly soluble in alcohol, and readily soluble in ether, chloroform, and petroleum benzene.

**Action and uses:** Benzoïnated lard is used principally as an ointment base.

**Magnesium sulfate** (epsom salts),  $MgSO_4$ , U.S.P. It contains, when rendered anhydrous by ignition, not less than 99.5 per cent of  $MgSO_4$ . It contains not less than 45 per cent and not more than 52 per cent of water. Preserve it in well-closed containers.

**Properties:** It occurs as small, colorless needle-like prisms, without odor, and having a cooling, saline, and bitter taste. It is soluble in 0.8 part of water, almost insoluble in alcohol, and is slowly efflorescent in warm, dry air.

**Preparation:** One of the methods of making magnesium sulfate is by the action of sulfuric acid on magnesium carbonate (mineral magnesite).

**Action and uses:** It is an extensively used saline cathartic. It should be given before breakfast in a saturated aqueous solution. It acts both by preventing absorption of fluid from the bowel and by drawing more fluid from the blood into the intestine. Applied externally in saturated solution on lint to swollen joints in acute arthritis, to swollen testicles in orchitis, and to boils, it relieves pain and congestion by extracting fluid from these parts. It is the chemical antidote for poisoning by lead acetate, producing an insoluble lead sulfate, and is also used in phenol poisoning. Magnesium sulfate can be made more pleasant to take by mixing it with sodium bicarbonate, citric acid, and tartaric acid. This mixture is known as Effervescent Salt of Magnesium Sulfate, N. F. (National Formulary).

**Average dose:** 15 grams or 4 drams.

**Morphine sulfate, U.S.P.** The sulfate of the alkaloid morphine. Preserve it in well-closed containers, protected from light.

**Properties:** It occurs in white, feathery, silky crystals, or cubical masses of crystals, or a white crystalline powder, odorless, and permanent in the air. It is soluble in 15.5 parts of water and in 565 parts of alcohol.

**Action and uses:** It is a powerful narcotic. It is depressant to the central nervous system, relieves pain, produces sleep, and tends to cause constipation. It is a dangerous habit-forming drug and should never be prescribed in repeated doses except by a

doctor. In case of acute poisoning by morphine, wash out the stomach with potassium permanganate solution and give stimulants.

Average dose: 0.008 gram or  $\frac{1}{8}$  grain.

**Quinine sulfate, U.S.P.** The sulfate of the alkaloid quinine. Preserve it in well-closed containers, protected from light.

**Properties:** It occurs in white, fine, needle-like crystals, usually lusterless, making a light and easily compressible mass; odorless and having a persistent, bitter taste. It is soluble in 810 parts of water and in 120 parts of alcohol. It is freely soluble in water to which has been added a small amount of diluted hydrochloric or sulfuric acid.

**Action and uses:** It is antimalarial, antipyretic, and a bitter tonic. It is used principally in the treatment of malaria for which it is specific. It should be noted that quinine sulfate is practically insoluble in water. If an aqueous solution is desired, it may be made by adding to the quinine sulfate mixed with the water in a graduate, diluted sulfuric or hydrochloric acid drop by drop until a solution is produced. An acid salt is formed in solution which is soluble in water.

Average dose: Tonic, 0.1 gram or  $1\frac{1}{2}$  grains; antimalarial, at least 1 gram or 15 grains daily.

**Santonin, U.S.P.** The inner anhydride of santoninic acid, obtained from several species of *Artemisia*. Preserve it in well-closed containers, protected from light.

**Properties:** It occurs in colorless crystals, usually tubular, or as a white, crystalline powder; odorless and nearly tasteless at first but afterwards developing a bitter taste; stable in the air but becoming yellow on exposure to light. It is slightly soluble in water and soluble in 43 parts of alcohol.

**Action and uses:** It is used principally as an anthelmintic for the removal of *Ascaris lumbricoides* (round worms) from the intestine. It makes objects appear to the patient as if viewed through a yellow glass (xanthopsia).

Average dose: 0.06 gram or 1 grain. (It is on the Supply Table in one-half grain tablets.)

**Silver nitrate,  $\text{AgNO}_3$ , U.S.P.** It contains, when powdered and dried to constant weight in a desiccator over sulfuric acid, in the dark, not less than 99.8 per cent of  $\text{AgNO}_3$ . Preserve it in dark amber-colored, glass-stoppered vials, protected from light.

**Properties:** Occurs in colorless, transparent, tubular, rhombic crystals, becoming gray or grayish black on exposure to light or in the presence of organic matter; odorless, and having a bitter, caustic, and strongly metallic taste. Soluble in 0.4 part of water and in 30 parts of alcohol. An aqueous solution is clear, colorless, and neutral to litmus paper.

**Preparation:** It is made by dissolving silver in nitric acid with the aid of heat.

**Action and uses:** Solutions of silver nitrate should be made with distilled water. Weak solutions are astringent and antiseptic to mucous membranes, and strong solutions are caustic. The mucous membrane should always be cleaned before applying solutions of silver nitrate. A 1 per cent solution is instilled into the eyes of the newborn immediately after delivery to prevent gonorrheal conjunctivitis. The action of silver nitrate can be immediately stopped by the application of sodium chloride (salt) solution, and this is often done when it is desired to limit the action of local application to the eye or throat. Silver nitrate forms on tissue a dense film of coagulated albumin. This film prevents deeper action of the silver nitrate. The film is at first white but soon becomes black, due to the reduction of the silver. A 4 per cent solution is used for application to the mucous membrane of the throat, mouth, or nose.

Average dose: 0.01 gram or  $\frac{1}{6}$  grain.

**Sodium bicarbonate (bicarbonate of soda, baking soda),  $\text{NaHCO}_3$ , U.S.P.** It contains, when dried to constant weight in a desiccator over sulfuric acid, not less than 99 per cent of  $\text{NaHCO}_3$ . Preserve it in well-closed containers in a cool place.

**Properties:** It is a white, crystalline powder, odorless and having a cooling, mildly alkaline taste. It is stable in dry air but slowly decomposes in moist air. When its aqueous solution is heated,

even mildly, it loses carbon dioxide and is converted into sodium carbonate. It is fairly soluble in water and is insoluble in alcohol. Its aqueous solution is alkaline to litmus, and the alkalinity increases as the solution stands, or as it is agitated or heated. When treated with acids it effervesces (the same thing occurs when any carbonate is treated with an acid).

**Preparation:** It is made by the Solvay process (ammonia soda process). A concentrated solution of sodium chloride is mixed with ammonia water; carbon dioxide under pressure is forced into this mixture, resulting in the formation of sodium bicarbonate and ammonium chloride. Sodium bicarbonate is precipitated (being less soluble), and the ammonium chloride remains in solution. This process also may be used in making sodium carbonate. After making the bicarbonate this may be heated, driving off carbon dioxide and water, leaving behind sodium carbonate.

**Action and uses:** A valuable and popular antacid. It is given frequently for hyperacidity of the stomach (heartburn), but it must be remembered that while it neutralizes the acid contained in the stomach it also causes increased secretion of more acid and may defeat the purpose for which it is given if administered over a long period. When used for heartburn it usually is combined with ammonium carbonate and oil of peppermint and given in tablet form (soda-mint tablets). It is used externally in saturated aqueous solution for the treatment of burns and poisoning by poison ivy. It may be used in the preparation of other compounds of sodium. It is the principal ingredient in baking powder. In making bread this substance, when acted upon by either alum or cream of tartar, liberates carbon dioxide, which becomes entangled in the dough and causes it to rise. The term "soda" often is applied to this compound, but "soda" is an incorrect term and might mean sodium carbonate or caustic soda. A solution for intravenous sodium bicarbonate should be colorless with phenolphthalein.

**Average dose:** 1 gram or 15 grains.

**Sodium perborate, U.S.P.** It contains not less than 9 per cent of available oxygen, corresponding to about 86.5 per cent of  $\text{NaBO}_3 \cdot 4\text{H}_2\text{O}$ . Preserve it in well-closed containers.

**Properties:** It occurs as white, crystalline granules or as a white powder. It is odorless and has a saline taste. It is stable in cool, dry air but is decomposed with the evolution of oxygen in warm or in moist air. One gram is soluble in 40 cc. of water. In aqueous solution sodium perborate is decomposed into sodium metaborate and hydrogen peroxide, the solution gradually evolving oxygen. Oxygen is evolved more rapidly if the solution is warm. A saturated aqueous solution is alkaline to litmus paper.

**Action and uses:** It is used as a cleansing mouth antiseptic. It is used in tooth pastes, tooth powders, and mouth washes. Solutions of sodium perborate should be prepared fresh as they easily decompose on standing.

**Average dose:** 0.06 gram or 1 grain.

**Sublimed sulfur (flowers of sulfur), S, U.S.P.** It contains 99.5 per cent S.

**Properties:** A fine, yellow, crystalline powder having a faint odor and taste. It is insoluble in water and nearly insoluble in alcohol. It is soluble in carbon disulfide, ether, and in olive oil. It burns in air to form sulfur dioxide gas.

**Action and uses:** Sublimed sulfur is not given internally. It is used in the preparation of washed sulfur.

**Sulfanilamide, U.S.P. (aminobenzenesulfonamide).** White, odorless crystals or crystalline powder soluble in water, alcohol, glycerin, or hydrochloric acid; insoluble in ether, chloroform, or benzene. Renders blood, spinal fluids, urine, and other tissue fluids unfavorable as mediums for supporting the active multiplication of susceptible bacteria.

**Uses:** It is used extensively for infections produced by certain strains of hemolytic streptococci, meningococcal infections, gonococcal infections, and certain urinary infections.

**Average dose:** 3 grams or 45 grains.

**Sulfapyridine (2—sulfanilylaminopyridine).** White, odorless, practically tasteless crystals or crystalline powder, soluble in water, alcohol.

**Actions and uses:** Antipneumococcic and antigonococcic. Used in pneumococcic pneumonia and other pneumococcic infections, and gonorrhea.

**Average dose:** 5 grams or 75 grains.

**Sulfathiazole.** A white, crystalline powder, soluble in water and alcohol. Saturated aqueous solution has pH of 6.0.

**Uses:** Certain staphylococcic infections, pneumococcic pneumonia, and gonococcic infections.

**Average dose:** 4 grams or 60 grains.

**Tannic acid (tannin, gallotannic acid), U.S.P.** A tannin usually obtained from nutgall. Preserve it in well-closed containers in a cool place, protected from light.

**Properties:** It is a yellowish-white to light brown, amorphous powder, glistening scales, or spongy masses, nearly odorless, and having a strong astringent taste. It is soluble in 1 part of glycerin and is very soluble in water or alcohol.

**Action and uses:** It is an astringent, and haemostatic. It is used in the form of an ointment for the treatment of haemorrhoids and in an aqueous solution as an astringent mouth wash and gargle. It is an alkaloidal precipitant and may be used as a chemical antidote in certain cases of alkaloidal poisoning. It is used extensively in the treatment of burns in the form of an aqueous solution or a jelly. It acts as an astringent, hinders the growth of bacteria, and "tans" the tissues in the burned areas, forming a crust over them which prevents the escape of fluids from the body.

**Tincture of ferric chloride (tincture of iron), U.S.P.** A hydro-alcoholic solution containing, in each 100 cc., about 13 per cent of ferric chloride ( $\text{FeCl}_3$ ), corresponding to not less than 4.5 per cent of Fe. Protect tincture of ferric chloride from light and keep it in a cool place, in glass-stoppered bottles.

**Properties:** A bright, amber-colored liquid, having a slightly ethereal odor, a very astringent, styptic taste, and an acid reaction.

**Preparation:** It is made by diluting 350 cc. of solution of ferric chloride with sufficient alcohol to make 1000 cc.

**Action and uses:** It should be administered well diluted with water and taken through a glass tube. The mouth should be thoroughly rinsed to avoid injury to the teeth. It is a valuable chalybeate (iron) tonic and styptic. It also has slight diuretic properties. It is used in making solution of iron and ammonium acetate (Basham's Mixture), N. F. (National Formulary).

**Average dose:** 0.5 to 2 cc. or 8 to 30 minims.

**Mild tincture of iodine, U.S.P.** Mild tincture of iodine contains, in each 100 cc., not less than 1.8 grams and not more than 2.2 grams of I and not less than 2.1 grams nor more than 2.5 grams of NaI (sodium iodide) dissolved in 50 per cent alcohol. Preserve it in the same manner as tincture of iodine.

**Action and uses:** This weak tincture is actively antiseptic and when applied to the abraded surface is not so painful as the strong tincture. The presence of iodides in both the strong and the weak tinctures improves their stability and increases their penetrability. With acetone iodine it forms an irritating compound. A solution containing 1 cc. of mild tincture of iodine to 100 cc. of 70 per cent alcohol is used as a local application in the treatment of trichophytosis (athlete's foot).

**Tincture of iodine, U.S.P.** An alcoholic solution of iodine and potassium iodide. One hundred cc. contains not less than 6.5 grams nor more than 7.5 grams of I, and not less than 4.5 grams nor more than 5.5 grams of KI. Preserve it in glass bottles, closed with stoppers resistant to corrosion, and in a cool place, protected from light.

**Preparation:** See U.S.P.

**Action and uses:** It is applied externally as a counter-irritant, disinfectant, and parasiticide. It may be applied to any part of the body externally except the eye. An alcoholic solution (half strength) containing equal parts of the tincture and alcohol is employed in the disinfection of the skin before operations. It penetrates into the pores and acts as a powerful germicide. It should never be painted over a surface that previously has been washed with bichloride of mercury solution because in the presence of the bichloride new compounds are formed which are intensely

irritating, especially under a dressing, and blistering of the skin is liable to occur. To get the best germicidal results from tincture of iodine, it should not be applied to a surface wet with water. Internally, tincture of iodine is used as an alterative. It acts as an irritating poison in large doses. The antidote is starch paste or starchy foods, such as bread and mashed potatoes. Iodine stains can be removed from linen with a solution of sodium thiosulfate.

Average dose: 0.1 cc. or 1½ minims (diluted with water).

## ELEMENTS OF PHARMACY

**311. Pharmacy.** Pharmacy is the science which treats of medicinal substances to include the art of preparing, compounding, and dispensing them, their identification, selection, preservation, combination, analysis, and standardization. The pharmacy is the place where medicines are kept. In the Army the practice of pharmacy is concerned primarily with the compounding and dispensing of the remedial agents in accordance with the prescriptions of medical officers.

*Compounding* is the skillful blending of two or more ingredients.

*Dispensing* is the transferring of a substance from one container to another for some reason.

The principal books used in the study and practice of pharmacy are the *United States Pharmacopoeia*, the *National Formulary*, dispensatories, and the textbooks on the principles and practice of pharmacy. Any medical soldier who is actively engaged in the practice of pharmacy should become thoroughly acquainted with the *Pharmacopoeia* and the *National Formulary*, and he should seek further knowledge by systematic consultation and study of fuller textbooks on Pharmacy.

The *United States Pharmacopoeia* is an authoritative book containing a list of standardized medicinal substances, with descriptions, tests, and formulas for preparing them. The word "official" as applied to a drug or preparation means it is listed only in the *Pharmacopoeia*.

The *National Formulary* is a book containing a list of extensively-used drugs and preparations that are not included in the *Pharmacopoeia*. The medicines which it contains are recognized because of their extensive medicinal use and pharmaceutical soundness, rather than their therapeutic value. The *National Formulary* is of secondary importance to the *Pharmacopoeia*.

A *dispensatory* is a commentary on the *United States Pharmacopoeia*, the *National Formulary*, the pharmacopoeias of other countries, and, in addition, it contains information about most of the substances that have been or are now used in the cure or prevention of disease. It is an excellent reference book for one studying pharmacy or medicine, as it gives a complete description of the physical, medical, and pharmaceutical history of medicinal substances, their preparation and properties, constituents and compounds, uses, action and doses, tests and assays, etc.

**312. Pharmacy Management.** A commissioned officer exercises general supervision of the pharmacy, and a responsible noncommissioned officer or experienced pharmacist is placed in direct charge.

*Pharmacy supplies.* Supplies for the pharmacy are drawn from the medical supply officer daily or at stated intervals. Issues to the wards and departments of the hospital are made daily upon prescriptions and requisitions.

The metric system is generally used in writing prescriptions and in keeping records.

**Prescription files.** Three prescription files are maintained: one for alcoholics and narcotics; one for prescriptions for civilians containing drugs other than alcoholics and narcotics; and one for routine prescriptions.

**Record of alcoholics and narcotics.** An accurate record is kept of all alcoholics and narcotics received and expended. This is verified at least every month by a medical officer. Poisons, alcoholics, and habit-forming drugs are kept in separate lockers and issued only on order of a medical officer.

Civilian employees may purchase medicine when prescribed by a medical officer. Funds received are deposited by the responsible officer with the nearest finance or disbursing officer.

**313. Weights and Measures.** The science of weights and measures is *metrology*. It includes measures of weight, length, surface, and volume.

**Weight** is the difference between the attraction of the earth and that of surrounding bodies for bodies on the surface of the earth.

**Measure** is the bulk or extension of bodies. It includes length and capacity.

**314. Standards of Weights and Measures.** The standards upon which the system of weights and measures are based are the *grain* and the *meter*.

**Grain.** The grain weight was based upon an act of King Henry III of England, in 1226. "An English silver penny, called the sterling, round and without clipping, shall weigh 32 grains of wheat, well dried out and gathered out of the middle of the ear."

**Meter.** The meter is  $1/40,000,000$  of the circumference of the earth at its poles, or 39.37 inches.

**315. System of Weights.** The system of weights used in pharmacy are the *avoirdupois weight*, the *apothecaries* or *troy weight*, and the *metric weight*. The avoirdupois weights and measures are in general use in the United States for commercial selling and buying; the apothecaries or troy weight is used by pharmacists in compounding; and the metric is used in scientific work.

**The avoirdupois weight.** In the avoirdupois weight,  $437\frac{1}{2}$  grains equal 1 ounce (oz.); 16 oz. equal 1 pound (1 lb.). Fractions less than one ounce are designated  $1/16$  oz.,  $1/8$  oz.,  $1/4$  oz., or in grains.

**The troy weight.** The equivalents of the avoirdupois or troy weight are illustrated in the chart below:

Grain (gr.)		Dram (3)		Ounce (oz.)		Pound (lb.)
60	equals	1				
480	equals	8	equals	1		
5760	equals	96	equals	12	equals	1

The difference between avoirdupois and troy (apothecaries) weights is as follows: An avoirdupois ounce equals  $437\frac{1}{2}$  grains; a troy ounce equals 480 grains. Therefore a troy ounce is  $42\frac{1}{2}$  grains heavier than the avoirdupois.

The avoirdupois pound equals 7000 grains; the troy pound 5760 grains. Therefore the avoirdupois pound is 1240 grains greater.

*The metric weight.* The metric weight is based upon the gram (gm.) as a basic unit. The *gram* is the weight of one cubic centimeter of water at 4 degrees centigrade.

To show increased multiples of the basic unit, the *gram* (basic unit) is multiplied by the Greek word: *Deka* (meaning 10), therefore dekagram signifies 10 grams; *Hecto* (meaning 100), therefore hectogram means 100 grams; *Kilo* (meaning 1000), therefore kilogram means 1000 grams. Less than one gram is tabulated in Latin words as follows:

**Deci (decigram) = 1/10 (0.1) gram**

**Centi (centigram) = 1/100 (0.01) gram**

**Milli (milligram) = 1/1000 (0.001) gram**

A rule of thumb is expressed by the letters GILD, signifying: Greek (G) increases (I); Latin (L) decreases (D).

A tabulation of the metric system as to systems of length, capacity, and weight follows:

Quantities	Length	Capacity	Weight
1000	kilometer	kiloliter	kilogram
100	hectometer	hectoliter	hectogram
10	dekameter	dekaliter	dekagram
<b>Basic Unit</b>	<b>meter</b>	<b>liter</b>	<b>gram</b>
.1	decimeter	deciliter	decigram
.01	centimeter	centiliter	centigram
.001	millimeter	milliliter (cc.)	milligram

**316. Systems of Capacity.** The systems of capacity as used in Pharmacy are apothecaries or wine measure, and the metric system.

The *apothecaries system* of capacity measures is shown below:

	Fluid	Fluid		
Minim (M)	dram (3)	ounce (oz.)	Pint (o)	Gallon (g)
60 equals	1			
480 equals	8	1		
		16 equals	1	
			8 equals	1

The *metric system* of capacity measure is as follows:

One liter equals a cube of a tenth of a meter.

One cubic centimeter (cc.) equals 1/1000 of a liter.

A gram and a cubic centimeter of water are identical.

A grain and a minim are not identical, for the weight of 1 fluid ounce (480 minims) of distilled water weighs 454.6 grains.

A drop and a minim are not identical because the weight or size of a drop is dependent upon the thickness of the liquid and the surface from which it is dropped.

**317. Measurement of Weight and Volume.** A weight is a body of known gravitating force used for weighing by means of an apparatus known as a balance. A balance is an apparatus for determining the relative weights of substances. There are two commonly used types: the single beam with equal arms, and the Torsian balance. In the former a beam is suspended on a knife edge which divides it into equal arms. On both ends of the arms at exactly equal distances from the knife-edge are suspended pans which carry substances to be weighed. In the Torsian balance, a compound beam is balanced and supported upon an immovable frame.

Upon the ends of the beam are fastened movable frames that support the pans.

*Liquids.* Liquids are measured by conical and cylindrical measuring vessels of metal, agateware, or glass. Glass measures are preferable except for measuring large quantities of fluid.

Graduated pipettes, which are glass tubes graduated on the side with a constricted point, are used for measuring minims. Owing to capillary attraction the top of a liquid in a graduated pipette presents a cup shape, which is known as a *meniscus*. A line drawn through the bottom of the meniscus is selected as the reading point on the scale.

Cylinders of glass with graduated scales imprinted on the side are used for measuring larger quantities of liquids. To facilitate measuring and dispensing of liquids, beakers and graduates are constructed with constricted points for pouring from one container to another.

*The specific gravity* (sp. gr.) or density of a substance or liquid is the weight of one body as compared with the weight of an equal amount or volume of distilled water. 1 cc. of distilled water (standard) weighs 1 gram. The weight of 1 cc. of another substance at the same temperature would be its specific gravity.

Specific gravity is determined by means of a specially constructed instrument called the hydrometer. It consists of a glass tube loaded at the bottom with mercury or small shot, having a bulb blown in it just above the loaded end.

The solid body floating in the liquid displaces a volume of liquid exactly equal to its own weight. Some liquids are heavier than water, some lighter; therefore, various types of hydrometers are used—urinometer for urine, saccharometer for sugar solutions, alcoholometer for alcohol.

**318. Domestic Measures and Their Equivalents.** Specially prepared measuring vessels may not always be available. The approximate equivalents for commonly used domestic measures are shown below:

One teaspoonful equals 1 fluid dram or 4 cubic centimeters.

One dessertspoonful equals 2 fluid drams or 8 cubic centimeters.

One tablespoonful equals 4 fluid drams,  $\frac{1}{2}$  ounce, or 15 cubic centimeters.

One wineglass equals 2 fluid ounces or 60 cubic centimeters.

One teacupful equals 4 fluid ounces or 120 cubic centimeters.

One canteen cap equals 3 fluid drams or 6 cubic centimeters.

**319. Calculation in Pharmaceutical Arithmetic.** The fundamental rules of arithmetic apply in a practical manner in pharmacy. Accuracy is absolutely necessary, as incorrect calculations may mean life or death. Speed should never take the place of accuracy.

*Conversion from apothecary system to metric and vice versa.* The basic conversion factors are as follows: 1 grain equals

0.065 gram; 15.5 grains equal 1 gram; 1 cubic centimeter equals 15 minims; 30 cubic centimeters equal 1 ounce.

**Problem:** Convert 3 grains to grams. Since 1 grain equals 0.065 gram, 3 grains equal three times 0.065 gram or 0.195 gram.

**Problem:** Convert 0.195 gram to grains. Since 1 grain equals 0.065 gram, 0.195 gram equal 0.195 divided by 0.065

gram or  $\frac{0.195}{1} \times \frac{1}{0.065}$  or 3 grains.

**Problem:** Convert 10 minims into cubic centimeters (cc.). Since 1 cc. equals 15 minims, 10 minims equal 10 divided by

15 minims or  $\frac{10}{1} \times \frac{1}{15}$  or 0.67 cc.

**Problem:** Convert 10 cc. to ounces. Since 30 cc. equal 1

ounce, 10 cc. equal 10 cc. divided by 30 cc. or  $\frac{10}{1} \times \frac{1}{30}$  or  $\frac{1}{3}$

ounce.

**320. Common Pharmaceutical Operations.** Pharmaceutical operations are those procedures by which a drug is converted, mixed, prepared, or arranged so as to render it effective for the therapeutic purpose it is intended. Some procedures require the use of heat; others do not. Some require chemical reaction, and others are mechanical alterations. Brief descriptions of some of the common operations used in pharmacy are stated below:

*Burning or ignition* is strongly heating a mineral substance with access to air to obtain a residue, which is the active principle.

*Carbonization* is the process of heating vegetable or animal (organic) substance to a high temperature without the access of air, producing charring. Charcoal is an example.

*Melting or fusion* is the process of liquefying solid substances by applying heat without the use of a solvent, such as the melting of paraffin.

*Vaporization* is the process of separating volatile (gas forming) substances, usually with the aid of heat at varying temperatures. To separate a volatile liquid from a less volatile liquid is called *evaporation*. To separate a volatile liquid from a solid is called *dessication*. To separate and obtain a volatile liquid is called distillation. The distilled liquid is collected in a different container as it condenses (returns from a vapor state to a liquid state). *Sublimation* is separating a volatile solid from a nonvolatile solid.

**321. Mechanical Subdivision of Drugs.** Mechanical subdivision of drugs or comminution is the process of mechanically reducing a substance to fine particles. Methods employed are cutting, slicing, grating, chopping, rolling, grinding, trituration, and pulverizing.

*Trituration* is the most frequently used method in pharmacy. The substance to be reduced is placed in a mortar (thick, smooth porcelain or glass bowl) and then ground by the use of a pestle (heavy porcelain or glass rod of the same material as the mortar). The motion of the pestle should follow the curve of a spiral, beginning in the center of the mortar and

working outward. A spatula (knife-like instrument) is used to remove powder which may cake on the surface of the mortar. This process may be facilitated in the preparation of certain drugs by adding water and making a paste. Later the paste can be placed into a larger vessel containing water. The heavier particles will settle, and the liquid containing the fine particles can be decanted into still another vessel. When the finer particles have settled to the bottom, the clear liquid is drawn off and the fine powdered particles allowed to dry.

**322. Separation of Solids and Liquids.** A *solution* is the permanent and complete incorporation of a solid or gaseous substance within a liquid. The *solvent* or *menstruum* is the liquid used; the *solute* is the solid or gas dissolved in the solvent. A *saturated solution* is one which cannot take up any more of the substance at ordinary temperature. A liquid saturated with one substance may still be a solvent for another substance.

The solvents used in pharmacy are water, alcohol, glycerine, ether, chloroform, acids, and alkalies. Water is a solvent for vegetable acids, salts, salts of alkaloids, gum starches, and albumins. Alcohol is a solvent for resins, volatile oils, alkaloids, and glucosides. Glycerine is a solvent for pepsin and tannins and a basis for glycerides. Ether is a solvent for oils, fats, resins, alkaloids, and glucosides. Chloroform is similar to ether; it dissolves phosphorus. Acids are used with water and alcohol to extract principles of such drugs as cinchona. Alkalies dissolve resinous bodies and are the basis for liniments.

There are several ways of separating solids and liquids.

*Decantation* is separating a liquid from a solid by pouring off the clear liquid after the solid has settled.

*Siphoning* is a process whereby a siphon (an inverted U-tube with one leg longer than the other) is first filled with the liquid and the shorter arm immersed in the liquid contained in the vessel. A current is established in this way, and the liquid runs off.

*Colation* or *straining* is the process of separating a solid from a liquid by pouring the mixture upon a cloth or porous substance which will permit the fluid to pass through but will retain the solid. Materials used are gauze, muslin, flannel, felt, etc.

*Filtration* is the process of separating liquids from solids to obtain the liquids in a transparent condition. Materials used are paper, paper pulp, asbestos, and porous stone. For ordinary filter operations a plaited filter paper may be used, but a plain filter paper should be used for retaining and washing the precipitates.

*Precipitation* is the process of separating liquids from solid matter by the formation of precipitates through the use of heat, light, or chemical action. The *precipitate* is the solid substance which settles to the bottom of the solution. It is separated then from the liquid by decantation or filtration.

*Sedimentation* is the process of separating solid matter

from the liquid in which it is suspended merely by the action of gravity. The solid substance which settles is the *sediment*.

*Crystallization* is the process by which crystals of the substance in solution are obtained by partial cooling, precipitation, or by deposit from solution during evaporation.

*Extraction* is the process of separating soluble principles from drugs by treating them with a liquid in which the principles are soluble. Common methods employed are infusion, maceration, and percolation.

*Infusion* is the process of extracting the water soluble principle from vegetable drugs by pouring hot water on the drug or by treating the drug with cold water for a definite period of time. The cold water method is used for volatile substances or when heat will destroy the active principle.

*Maceration* is the process of soaking the drug until the soluble portion of the drug is dissolved. Shaking assists this process. The insoluble material is separated by straining or expressing the liquids by means of pressure (use of a press). When gentle heat is applied to the process of maceration it is called *digestion*.

*Percolation or displacement* is the process whereby a powder contained in a suitable vessel is deprived of its soluble constituents by the descent of a solvent through it. The percolator is the cylindrical vessel which permits the solvent to come through the solute (percolate). The liquid coming from the percolator is impregnated with the soluble principles of the drug. The percolation of coffee is an example.

**323. Preparation of a Percentage Solution.** Multiply the volume of the solution desired by the percentage. Example: Prepare 100 cc. of a 5 per cent solution of argyrol. Multiplying 100 cc. by .05 gives 5. Therefore, 5 grams of argyrol would be dissolved in sufficient water to make 100 cc. of 5 per cent solution of argyrol.

**324. Common Pharmaceutical Preparations.** Standard pharmaceutical preparations may be grouped into two classes: liquids and solids.

*Liquid preparations.* Collodions have a base of pyroxylin (gun-cotton) in a mixture of ether and alcohol; when applied to the skin, the ether and alcohol evaporate, leaving a thin film of gun-cotton (new-skin) which acts as a protective covering.

Decoctions are made by boiling vegetable drugs with water for 15 minutes. Fifty grams of the drug coarsely reduced are boiled with sufficient water to make one liter of decoction. Decoctions must be dispensed only when fresh.

Elixirs are aromatic, sweetened, hydro-alcoholic solutions, often containing active medicinal substances.

Emulsions are soft, liquid preparations resembling milk and consisting of an oily or resinous substance suspended in water by means of gum, yolk of egg, or other viscid matter. Shaking oil and water vigorously produces an emulsion, but the particles soon separate. Some soapy mucilaginous or albuminous substance, such as acacia, tragacanth, or egg yoke, is added, which retains the suspension. Such agents are known as emulsifiers.

Fluidextracts are made of vegetable drugs and contain alcohol as a solvent. A fluidextract is made so that 1 cubic centimeter contains 1 gram of the drug which it represents.

Glycerites are mixtures or solutions of medicinal substances which contain glycerin. Adding water will not cause precipitation of the substance dissolved. The strength of these solutions may therefore be decreased by the addition of water.

Infusions are made by treating vegetable substances with either hot or cold water. Infusions should be used as soon as possible, as they will deteriorate.

Liniments are solutions or mixtures of various substances in oily or alcoholic liquids. They are applied externally by rubbing into the skin.

Liquors are aqueous solutions of nonvolatile substances, such as Lugol's solution and solution of boric acid. They usually contain active medicinal principles.

Lotions are aqueous preparations, usually containing insoluble suspended matter, and are intended for use as washes or injections, such as calomine lotion.

Mixtures are aqueous liquid preparations intended for internal use, which contain suspended insoluble substances, such as chalk mixture, Brown's Mixture. The active principle is an insoluble, nonfatty substance.

Mucilages are thick, aqueous preparations containing viscid drugs in solution or suspension, made by dissolving gum in water, or by extracting with water the mucilaginous principles of vegetable substances.

Oleoresins consist principally of natural oils and resins extracted by percolation with acetone, ether, or alcohol, followed by distillation and evaporation of the solvent which leaves behind the oleoresin. Turpentine and copaiba are natural oleoresins.

Spirits are alcoholic solutions of volatile substances and usually are 10 per cent in strength.

Syrups are concentrated solutions of sucrose in water or aqueous preparations. Those in plain water are called simple syrups; those containing non-medicinal aromatics or flavored substances are called flavored syrups.

Tinctures are hydroalcoholic preparations of vegetable and animal drugs. They are commonly of 10 per cent strength, containing 10 grams of the active principle of the drug in 100 cubic centimeters of the completed tincture.

Vinegars are solutions of the active principle of vegetable drugs in diluted acetic acid.

Waters or aquae are saturated solutions of volatile oils or other aromatic or volatile substances in distilled water, such as ammonia water and peppermint water.

Ampules are glass containers, usually hermetically sealed (without air) after filling, holding a single dose of a solution, or suspension, or powder, in a sterile condition, and intended for hypodermic administration.

*Solid preparations.* Cerates are combinations of medicinal drugs with fats and waxes for external application. They are usually made with oil, lard, or petrolatum for a basis, with enough wax or paraffin added to raise the melting point of the base.

Ointments are soft, fatty preparations intended for external application, such as boric acid ointment, and zinc oxide ointment.

Pills are small, solid bodies of globular, ovoid, or lenticular shape, which are intended to be swallowed and thereby produce remedial action. Cathartic pills are an example.

Powders are solid preparations consisting of powdered drugs in intimate admixture, such as Dover's powders. The drugs are first powdered and then mixed. Powders may be prepared in bulk or divided into papers and folded in individual doses.

Suppositories are solid bodies of various weights and shapes, adapted for introduction into the different orifices (openings) of the human body and melting at body temperature. The active principle is mixed with cacao butter or glycerinated gelatin, then shaped by moulding or by hand rolling. The size and shape are made to fit the place of insertion. Urethral suppositories are about 7 centimeters long and weigh 2 grams; rectal suppositories are conical or bullet-shaped and weigh about 2 grams.

Tablets are small, disc-shaped forms of medication, either molded or compressed in a special machine, such as acetylsalicylic acid (aspirin) tablets.

**325. Prescription Defined.** A prescription is the formula of a medical officer, directing the compounding and use of medicines. It follows a certain form established by long usage, each portion of which has a designation. Below is a form.

March 30, 1941		Date
Roy T. Walker, Pvt., Co A 22d Inf.		Name and organization
℞ (meaning, "you take.")		Superscription
Potassium chlorate	40	Inscription
Salicylic acid	10	
Tincture of iron chloride	40	
Glycerin	300	
Water qs ad	1200	Subscription
Mix for a gargle.		
Use locally as a gargle, at first		Signa
diluted with equal part of water.		
Dale E. Wagner,		Signature of medical officer.
Captain, Medical Corps.		

Inscription is the body of the prescription. Potassium chlorate and salicylic acid are the active ingredients. Tincture of iron chloride is the adjuvant. It aids the active ingredient in doing its therapeutic work. Glycerin is the corrective because it overcomes any side effects of the active ingredient. In this prescription, glycerin prevents any irritation to the throat by its demulcent action. Water is the vehicle or base. The subscription is the directive of the medical officer to the pharmacist. The signa is the directive of the pharmacist to the patient; that is, it is usually the direction of the medical officer labelled on the medicine container by the pharmacist, and given to the patient.

**326. Incompatibility Defined.** Incompatibility of drugs means their unfitness for combination in the same prescrip-

tion. There are three important types of incompatibility: therapeutic, pharmaceutical, and chemical.

*Therapeutic incompatibility* is demonstrated when drugs are combined which act contrary to each other upon the system. It is the question of medicinal action of drugs and is beyond the ken of pharmacists.

*Pharmaceutical incompatibility* is demonstrated by insolubility or physical precipitation of the drugs involved or such physical action which is contrary to the desired result or which will affect the therapeutic action adversely.

*Chemical incompatibility* is demonstrated by chemical precipitation, effervescence or evolution of gas, or a change to abnormal color, any of which may be adverse to the therapeutic action desired.

**327. Toxicology.** Toxicology is the science of poisons. It is that science which treats of the nature, properties, effects, detection of poisons, and the treatment of poisoning. A *poison* is any substance which independent of any mechanical action uniformly causes serious bodily injury, disease, or death when applied to, introduced into, or developed within the body. The legal definition is any substance capable of causing death when given in a dosage of 60 grains or less. An *antidote* is any agent which neutralizes a poison or otherwise counteracts or opposes the poison or its effects.

*Importance to the medical soldier.* The medical soldier may be called on in an emergency to treat cases of poisoning. As time is so momentous a factor in these cases, he is not only justified but morally obliged to trespass on what may be technically the medical officer's field. It should be remembered that duty, as medical soldiers, never extends beyond the emergency first aid treatment; to neglect to call a medical officer at once is not only to fail in responsibility to the patient but also to lay oneself open to trial by courts-martial. Promptness of action is perhaps the most important of all virtues in treating cases of poisoning; in a large proportion of instances the fate of the patient depends on what is done in the first fifteen minutes after the ingestion of the drug. See first aid treatment for poisoning in chapter 15.

## ATTACHED MEDICAL PERSONNEL

**328. Medical Detachments.** *a.* Tables of Organization provide a detachment of medical troops for each regiment and separate battalion of every arm and service except medical. The term "attached medical" applied to these detachments may convey an erroneous impression of their relationship to the organizations they serve. By definition both a battalion and a regiment are units composed organically of the troops of a single arm or service. For this reason any component element of a battalion or a regiment, made up of troops of another arm or service, must be attached rather than assigned. However, the medical detachment of a unit occupies the same relative position in the unit as a company, troop, or battery.

*b.* These medical detachments are the foundation upon which is erected the entire structure of field medical service. They provide the primary medical care and treatment without which the value of the more elaborate arrangements in the rear would be considerably lessened. The ultimate recovery of sick or injured depends oftener upon the care and treatment given in forward areas than upon the more refined procedures of field hospitals.

**329. Organization of Medical Detachments.** *a. General.* A unit medical detachment is organized into one headquarters and headquarters section and a battalion section for each battalion in the unit. It is commanded by the senior officer of the Medical Department on duty therewith.

*b. Headquarters.* While usually tabulated in Tables of Organization as a part of the headquarters section, the detachment headquarters has the same administrative relationship to all sections. Limited personnel and other considerations may restrict the detachment headquarters to the detachment commander alone, and he may have additional duties in connection with the headquarters section. Nevertheless, a detachment headquarters exists as long as the function of command is exercised over the detachment as a whole.

*c. Headquarters section.* The headquarters section furnishes the overhead for the administration of the detachment, provides medical service for the unit headquarters and for companies that are not parts of battalions, and serves as a small reserve with which the unit surgeon may influence and assist the medical service of the battalions. The detachment overhead is held to the minimum consistent with efficient operation, and all personnel engaged therein are available for other duties in combat. If the character of the unit served by the detachment so indicates, and the headquarters section is of sufficient size, it may be organized into a regimental aid station group and one or more litter squads. Company aid men ordinarily are not furnished to the nonbattalion companies.

*d. Battalion sections.* A battalion medical section provides

medical service for a battalion at such times as it is impracticable to operate the medical service for the regiment as a unit. Its internal organization depends upon the characteristics of the troops it serves. Ordinarily it includes an aid station group and two company aid men for each company of the battalion. To the battalion sections of regiments of infantry and of artillery normally supporting infantry are added one or more litter squads; but litter squads are omitted in highly mobile units such as cavalry, horse artillery, and

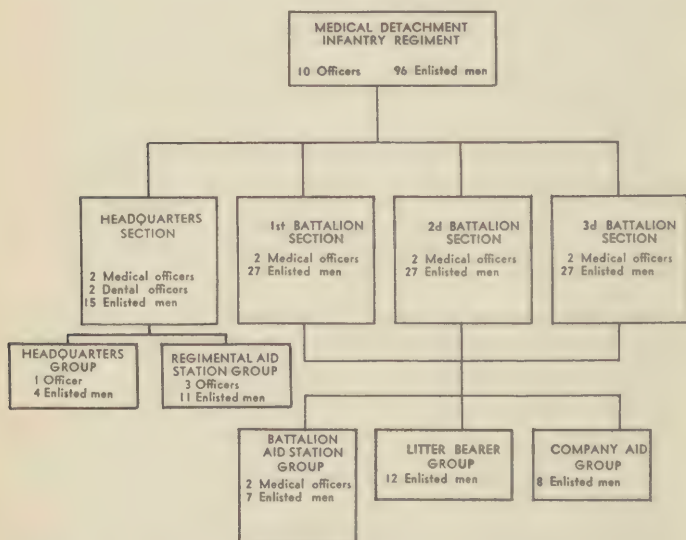


Figure 109. Organization of the Regimental Medical Detachment With an Infantry Regiment. T/O 7-11, Nov. 1, 1940.

mechanized or armored regiments. The battalion section is a subordinate element of the regimental medical detachment, and not of the battalion it normally serves. It is not organized for administration and, if detached from the regimental detachment, must improvise such organization. In the interest of efficiency, a battalion section should be allocated habitually to the same battalion; but situations may arise when exceptions to this rule are indicated.

*e. Veterinary section.* When veterinary service is provided a unit, the personnel engaged therein are organized into the veterinary section of the unit medical detachment. This section is commanded by the senior officer of the Veterinary Corps present for duty therewith, who is also the unit veterinarian. The section occupies a position in the unit medical detachment comparable to that of any of the other sections.

**330. Supply of Medical Detachments.** *a. In other than combat situations.* The commanding officer of the detachment is responsible for its supply. He submits to the unit supply officer the requirements of all articles of equipment authorized in Tables of Basic Allowances except that, in permanent camps, he may submit directly to the camp quartermaster his requisitions for the articles of clothing chargeable to enlisted men's clothing allowances. The unit supply officer requisitions the property and, upon its receipt, issues it to the detachment commander on memorandum receipt. The detachment commander, though responsible, is accountable for no property. For further details see AR 35-6520.

*b. In combat.* The urgency of supply in combat demands both simplicity and flexibility in methods. Commanding officers, both of unit detachments and of battalion sections thereof, will procure all supplies except medical through the channels provided for other elements of the unit. They will procure medical supplies in any one of the following ways:

(1) By informal request sent to the medical unit in direct support, ordinarily a collecting company. Such supplies will be delivered by litter bearers or ambulances going forward.

(2) By informal request sent to the nearest medical dump. Delivery may be made by ambulance and litter bearers, by transport of the medical supply agency, by transport of the medical detachment or section, or by any combination of these means.

(3) In emergencies the detachment commander may direct the transfer of a part of the combat equipment of one medical section to another.

(4) In the same manner as set forth in *a* above.

(5) By any combination of the methods outlined above.

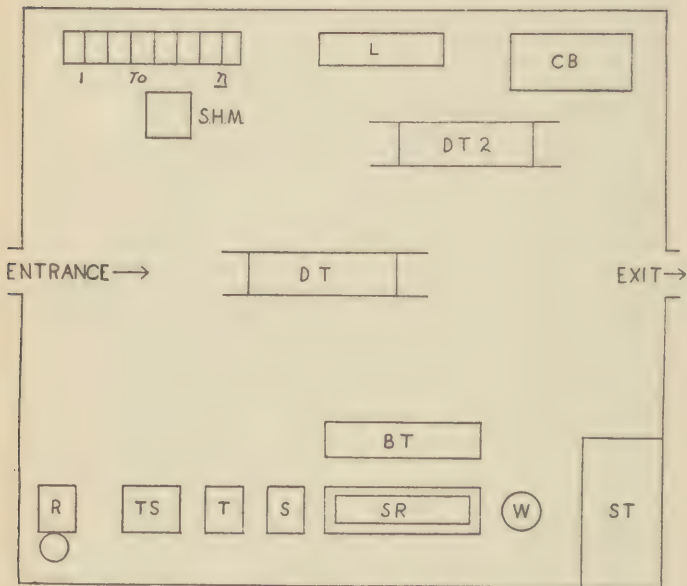
*c.* When there is property accountability, nonexpendable property procured from agencies other than the unit supply officer must be reported to him as soon as practicable in order that he may account for it in the prescribed manner.

**331. Dispensaries.** *a.* A dispensary is an establishment for the routine treatment of slightly sick and injured that are not incapacitated for duty. It is established only when the unit it serves is not exposed to battle casualties. This relative freedom from enemy action permits the use of a more diversified equipment in a dispensary than in an aid station.

*b.* Considerable time and effort may be conserved for other important activities, such as training, if the principle of economy of force be applied in the routine care of the sick and injured. In a compact area, one dispensary may serve the entire regiment, and the personnel therefor may be taken from the various sections and rotated so as least to interfere with other requirements. Dispersion of the elements of the regiment served, however, will require the operation of one or more battalion dispensaries in addition to the regimental dispensary.

**332. Aid Stations.** *a. Definitions.* An aid station is an installation for the first aid care and treatment of the sick and injured established under combat conditions by a section of a unit medical detachment.

(1) *Regimental aid station.* The regimental aid station is established by the headquarters section. It ordinarily serves the regimental headquarters and such companies as are not parts of battalions, and is in the same echelon of evacuation as are battalion aid stations. This is to say that rarely are



#### LEGEND

R RECORDS  
 DT DRESSING TABLE  
 S TABLE WITH SOLUTIONS  
 T TABLE WITH INSTRUMENTS  
 SR SPLINT RACKS  
 BT TABLE WITH BANDAGE  
 CB CASE OF BLANKETS  
 W WATER

L LITTERS  
 SHM STAND FOR HYPO-  
 DERMIC MEDICATION  
 AND A.T.S.  
 DT2 DRESSING TABLE FOR  
 TREATMENT OF WALK-  
 ING WOUNDED  
 S.T SURPLUS STORES  
 TS STERILIZER TABLE

1 TO 8 MEDICAL CHESTS

Figure 110. One Arrangement of Aid Station. Arrangements Vary With Characteristics of Site.

casualties evacuated from a battalion aid station to the regimental aid station. Other employment of this aid station varies with the situation. It may take over the casualties of a battalion aid station that is forced to move before it can be evacuated. It may be established in the area of the regimental reserve so that, when the reserve is com-

mitted, the medical personnel of the reserve may be free to accompany it without the delay incident to the disposal of casualties. In other situations the regimental aid station may not be established, the personnel of the headquarters section being used elsewhere.

(2) *Battalion aid station.* A battalion aid station is established by a battalion section to serve a battalion, including any detachments.

(3) *Veterinary aid station.* Since there is but one veterinary section in a regimental medical detachment, ordinarily only one veterinary aid station is established by the veterinary section. This serves all animals in the regiment.

b. *Location.* Because of the greater importance of other requirements, the physical features of the site of an aid station will vary from a comfortable building to a few square yards of ground without shelter from the elements.

(1) *Desirable features.* It will rarely be possible to find a site that satisfies all requirements, but the following features are desirable in an aid station site:

(a) Protection from direct enemy fire.

(b) Convenience to the troops served.

(c) Economy in litter carry.

(d) Accessibility to supporting medical troops.

(e) Proximity to natural lines of drift of wounded.

(f) Facility of future movement of the station to front or rear.

(g) Proximity to water.

(h) Protection from the elements.

(2) *Undesirable features.* Locations in proximity to terrain features or other military establishments that invite enemy fire or air action should be avoided. Examples are prominent landmarks, bridges, fords, important road intersections, battery positions of artillery and heavy weapons, ammunition dumps, and other distributing points.

c. *Functions.* The functions of an aid station are:

(1) Reception and recording of casualties.

(2) Examination and sorting of casualties; returning the fit to duty.

(3) Dressing or redressing of wounded; treatment, limited to that necessary to save life or limb and to prepare patients for evacuation for short distances; administration of narcotics and prophylactic sera.

(4) Prophylaxis and treatment of shock and exhaustion with hot foods and drinks.

(5) Temporary shelter of casualties, when practicable.

(6) Transfer at the aid station, of evacuees to the supporting medical echelon.

d. *General procedure of operation.* (1) An aid station must keep at all times in contact with the unit it is supporting. It must be moved, by echelon if necessary, as soon as movement of the combat elements makes a previous location unsuitable.

(2) Only such part of an aid station is established as immediate circumstances require or for which need can be foreseen. Rapid forward movement of combat elements is

usually associated with small losses; and casualties can be collected by litter squads into small groups along the axis of advance and given first aid. Such casualties can be evacuated promptly by the medical unit in close support, thus relieving the need for an established aid station and permitting the medical section to keep up with the combat troops.

(3) An aid station is not the proper place for the initiation of elaborate treatment. Such measures will retard the flow of casualties to the rear and immobilize the station. (See c(2) above.)

*e. Organization.* The organization of an aid station will depend upon the unit and the situation. In general, the functions of recording, examination, sorting, treatment, and disposition must be provided for in every situation. These will require one or more medical officers, assisted by noncommissioned officers and enlisted technicians. The allocation of personnel to these functions is a responsibility of the section commander.

*f. Equipment.* The equipment of an aid station is limited to the instruments, medicines, dressings, foods, blankets, and litters necessary for the emergency care and treatment of casualties. It is sufficiently compact to be transported on one vehicle of the light cargo type used in the unit, in two Medical Department carts, or on pack animals. Available equipment is ample enough to initiate and sustain combat until replacement can be made through medical supply channels. It is combat equipment, and the transport carrying it travels with that part of the train that accompanies the unit into action. ,

**333. Litter Squads.** *a. Composition.* A litter squad ordinarily consists of four bearers. Fewer bearers are unable to withstand the fatigue of long or frequent carries.

*b. Functions.* (1) Maintaining contact with combat elements.

(2) Prompt removal of all nonambulant sick and injured from the fighting line and their evacuation to the aid station.

(3) Directing and assisting the ambulant sick and injured to the aid station.

(4) When necessary, searching the field for sick and injured; administering first aid treatment, tagging, and evacuation to the aid station.

(5) Assisting the aid station group in moving and reestablishing the aid station.

**334. Company Aid Men.** *a.* The need of immediate first aid care and treatment at the scene of injury is met by the detail of one or more medical soldiers to each company. These are the company aid men. They follow their respective companies in battle, giving such first aid treatment as is possible under the conditions; tagging the casualties, including the dead; placing nonambulant sick and injured in advantageous positions where they will be sheltered until evacuated by the litter squads; and directing ambulant casualties to the aid station. They keep their unit surgeons informed of the tactical and medical situations in their front by means of messages carried by litter squads.

*b.* The usefulness of a company aid man is increased if he

knows and is known by the company to which he is detailed. This indicates the detail of the same aid men to the same companies whenever practicable. When medical detachments or sections are distributed among several organizations for messing, aid men should be messed with their respective companies. However, unless he is formally attached to a company, an aid man is immediately responsible to his section commander. The discipline, training, supply, and administration of aid men are functions of medical command.

**335. Regimental Surgeon.** *a. Designation.* Surgeons of regiments are known as regimental surgeons.

*b. Status and functions.* (1) The regimental surgeon has a dual status. He is a staff officer of the regimental commander and he is in immediate command of the regimental medical detachment. Such of his functions as pertain to the health and medical service of the command are exercised in his capacity of a staff officer. Those that are associated with the administration, training, and operations of the medical detachment are command functions. While certain of his duties involve both staff and command functions, the distinction between the two must be clearly recognized.

(2) He is responsible for the organization of the detachment and the assignment of commissioned and enlisted personnel to the several sections. He conducts so much of the training of the detachment as is not given in conjunction with the training of the combat elements of the regiment. He establishes and operates the regimental dispensary, and supervises the operation of battalion dispensaries. He makes the required medical inspections and keeps the regimental commander informed of the medical situation in the regiment.

(3) The regimental surgeon, as detachment commander, has the same supply responsibility as a company commander. As a staff officer of the regimental commander, it is his duty to inform the regimental commander of any deficiencies in items of medical supply issued to and used by the combat elements of the regiment.

(4) As the regiment approaches combat, the surgeon's duties as a regimental staff officer assume increasing importance. He learns of the plans for the distribution and employment of the units of the regiment, of the opposition the various elements are expected to meet, and of the terrain over which they will operate. From this information he makes a medical estimate of the situation, deducing the probable areas of casualty density, and from this he indicates the areas to be reconnoitered for aid station sites. He prepares the medical plan and submits it to the regimental commander. If the regiment has a veterinary service, this will include the veterinary plan.

(5) Methods of influencing the medical service within the battalions include such steps as establishing the regimental aid station for the purpose of relieving one or more battalion sections of the necessity for early establishment, reinforcement of one or more battalion sections with personnel from the headquarters section or from other battalion sections, and securing medical supplies prior to combat and distributing

them to the several sections in accordance with their needs as he foresees them.

(6) During combat the regimental surgeon is concerned with reports of the progress of the fight. From these he visualizes the needs of the various medical sections and takes steps to assure replacements or reinforcements of personnel and replenishment of supplies. He keeps in touch with the forward planning of the regimental staff. When the regimental commander contemplates a special mission for one of the battalions, the surgeon can clear that battalion of wounded by directing the regimental aid station to move to the vicinity, or he may request special priority in the evacuation of the aid station of that battalion.

(7) One of the most important duties of the regimental surgeon in combat is keeping the medical unit of the next higher echelon informed of the situation in his front, especially any change that will affect the evacuation of his aid stations.

(8) The regimental surgeon is provided with one or more commissioned assistants. To such he may assign part of his duties, but none of his responsibilities.

**336. Battalion Surgeon.** *a. Definition and designation.* Except in the case of separate battalions, surgeons are not provided as permanent staff officers of battalion commanders. When medical personnel are attached to a battalion, the senior officer of the Medical Corps, so attached, is the battalion surgeon. His official title is the "surgeon," followed by the designation of the battalion; e.g., the surgeon, 2d Battalion, 4th Infantry. When a battalion section is not attached to a battalion for duty, its commander has no staff functions. His command functions are comparable to those of a platoon commander; and he is, in addition, an assistant of the regimental surgeon.

*b. Duties and responsibilities.* The staff functions of a battalion surgeon are comparable to those of a regimental surgeon. His command functions are not as extensive. The battalion section has no normal administrative or supply functions, and assumes these only when it is impracticable for the regimental detachment headquarters to undertake them. The supply responsibility of the section commander is limited to keeping the detachment commander informed of the status of the battalion section equipment and, in combat, the emergency procurement of supplies. The duties and responsibilities of the battalion surgeon in combat are to:

(1) Obtain from the battalion commander the available information and tactical plan of the battalion. Make a medical estimate of the situation and, when practicable, a reconnaissance of possible aid station sites. Submit the medical plan to the battalion commander.

(2) Make the necessary dispositions of the battalion section.

(3) Establish the aid station when and where indicated, supervising its operation and personally assisting in the care and treatment of casualties whenever necessary.

(4) Supervise the employment of the litter squads.

(5) Keep in contact with the battalion commander and the

forward planning of the battalion staff, and project his own plan to correspond.

(6) Make or cause to be made the necessary reconnaissances, when practicable, for relocation of the aid station.

(7) Keep the battalion commander informed of the medical situation, and make the necessary recommendations for reinforcement of the medical service.

(8) Furnish information to the regimental surgeon and to the medical unit in immediate support of the situation in his front with such requests for special support or immediate evacuation of his casualties as may be necessary.

(9) Perform such other duties as the battalion commander may require.

**337. Dental Service.** *a. Organization.* Personnel of the dental service, both commissioned and enlisted, ordinarily are assigned to the headquarters medical section. The senior dental officer is the unit dental surgeon. As an assistant of the unit surgeon, he supervises the dental service of the unit. To each dental officer is assigned for duty one enlisted assistant who is at his immediate disposal for technical training and employment. Additional enlisted men may be allocated to the dental service. Enlisted men of the dental service are trained in the general duties of the medical soldier and are available in combat for any duty that may be required of them.

*b. Equipment.* The unit equipment of a medical detachment includes a portable dental dispensary for each dental officer authorized by the Tables of Organization. In addition, all dental officers and dental assistants carry individual equipment of a technical nature.

*c. Employment.* (1) *In other than combat situations.* The functions of the dental service are dental inspection and classification of all troops in the unit, supervision of the instruction in oral hygiene, and the treatment or correction of dento-oral diseases, injuries, abnormalities, and deficiencies. Dental officers operate one or more dental dispensaries, ordinarily combined with regimental or battalion dispensaries. They may be attached temporarily to battalions that are located in areas inconvenient to the regimental dispensary.

(2) *In combat.* While the technical training and skill of the dental service are to be utilized in its own field whenever indicated, the functions of first aid to and emergency care and evacuation of casualties become the paramount responsibility of the medical service in combat. The dental personnel are employed in combat as any other personnel of the medical service. They may be used in the regimental aid station, or attached individually to any battalion section.

**338. Veterinary Service.** *a. Organization.* Veterinary service is, of course, included in the medical service of only those units in which there are animals. By reason of its distinctive field of endeavor, the veterinary service is granted the degree of autonomy required for the proper discharge of its functions. The personnel of the veterinary service, both commissioned and enlisted, are organized into the veterinary section of the regimental medical detachment. The senior veterinary officer commands this section and as the unit veterinarian is an

assistant of the unit surgeon. The veterinary section depends for supply and administration upon the detachment headquarters, and the responsibility of the section commander in these matters is the same as that of a battalion section commander.

*b. Equipment.* In addition to the individual equipment of its officers and enlisted men, the veterinary section is provided unit dispensary and combat equipment sufficient for the routine care and treatment of slightly sick and injured animals and for the first aid treatment and evacuation of battle casualties among animals. Transportation, either pack or wheeled, is furnished for the unit equipment.

*c. Employment.* (1) *In other than combat situations.* The principal functions of the veterinary detachment in other than combat situations are:

(a) The care and treatment of slightly sick and injured animals.

(b) Classification of disabled animals into serviceable and unserviceable, and destruction of the latter class as authorized.

(c) Sanitary supervision of stables, corrals, and picket lines.

(d) Sanitary inspection of forage and of foods of animal origin issued for consumption by the troops of the unit.

(e) The prevention and control of communicable diseases in animals.

(2) *In combat.* (a) *Unit veterinarian.* When combat is imminent, the unit veterinarian makes a reconnaissance, when practicable, for suitable sites for veterinary aid stations and recommends one or more to the unit surgeon. The latter coordinates the requirements of the veterinary service with other requirements, selects a site for the veterinary aid station, and includes it in the unit medical plan. The unit veterinarian establishes and operates the veterinary aid station. He directs the veterinary service of the unit. He furnishes necessary information to the unit surgeon and to the veterinary unit in immediate support of his aid station.

(b) *Veterinary aid station.*

1. *Organization.* Ordinarily only one veterinary aid station is established for each regiment or unit of comparable size. When a battalion or squadron is operating at such a distance as to make evacuation difficult or impossible, the veterinary detachment may be split and operate two veterinary aid stations. In small veterinary detachments all personnel are required for the operation of the veterinary aid station. In larger detachments it may be advantageous to attach temporarily veterinary aid men to squadrons or battalions, and in mounted cavalry action one to each troop.

2. *Location.* Insofar as they apply to the care, treatment, and evacuation of animals, the characteristics of a location for an aid station are desirable for the location of a veterinary aid station. Areas of animal casualty density may be expected where animals are most numerous.

3. *Functions.* The functions of the veterinary aid station are reception and recording of animal casualties, first aid treatment of sick and injured animals, the prompt return

to the organizations of such animals as are fit for further duty, the collection for evacuation of salvageable animals that are temporarily incapacitated for duty, the destruction of all nonsalvageable animals, and the transfer at the veterinary aid station of animal evacuees to the supporting veterinary echelon. The veterinary aid station must not become immobilized by undertaking definitive care of disabled animals. Such animals as cannot be returned to duty or prepared for immediate evacuation must be destroyed.

**339. Training.** *a. Responsibility.* The regimental (or separate battalion) commander is responsible for the training of the medical detachment of his unit.

*b. Conduct.* The unit surgeon conducts all training of the medical detachment that is not conducted jointly with other elements of the unit. Technical training of dental and veterinary personnel is under the immediate direction of the unit dental surgeon and the unit veterinarian, respectively.

*c. Purpose.* The purpose of the training of a medical detachment is to insure prompt and efficient care and treatment of the sick and injured of the unit, the coordination of the medical service with the operations of the unit, and the competency of the detachment to maintain itself in the field with the resources at its disposal.

*d. Scope.* (1) *General training.* (a) *Military.* The basic military training common to all arms and services, formations and ceremonies of the unit of which the detachment is a part, formations under fire, and map reading and orientation **on the ground.**

(b) *Technical.* First aid, pharmacy, nursing, dressing of wounds, control of hemorrhage, splinting of fractures, and transportation of the sick and injured.

(2) *Special training.* Training of specialists in administration, supply, transportation, and the technical specialties pertaining to the care and treatment of sick and injured men and animals.

(3) *Tactical training.* (a) *Separate.* Training under the unit surgeon in the dispositions and employment of the medical detachment in combat, establishment and movement of aid stations, use of combat equipment, and the collection of casualties. For veterinary personnel, this phase of training will pertain to the tactical employment of the veterinary section.

(b) *Combined.* Participation in map maneuvers, command post exercises, tactical rides, field exercises, and field maneuvers of the unit of which the detachment is a part.

**340. Quarters and Rations.** *a. In posts or camps.* There are advantages in administration, supply, employment, and training of a unit medical detachment in quartering the several sections of the detachment together. Such an arrangement does not preclude joint training of the sections with the units they serve in action. Tables of Basic Allowances include no mess equipment for attached medical personnel, nor are cooks provided in Tables of Organization. In large detachments it may be expedient at times to draw mess equipment and detail cooks. Otherwise, the detachment is mess

with one of the companies, or each of the several sections with a different company.

b. *In field.* (1) *In other than combat situations.* With the unit well concentrated, medical service may be centralized in one dispensary, and the entire detachment quartered in one area. (See *a* above.) However, dispersion of the unit over a considerable area will require a suitable distribution of the several sections of the detachment. In the field the medical detachment habitually messes with one or more of the companies of the unit. If the detachment is distributed among several companies, it is preferable that each battalion section mess with one company of its battalion, and that the headquarters section mess with one of the companies not a part of a battalion. The veterinary section may be attached for rations with still another company that is more conveniently located. When company aid men are attached to the companies, they will mess with their respective companies.

(2) *In combat.* The several sections are quartered and rationed with the troops they are serving—company aid men with their companies, and the remainder of the section with one of the companies.

**341. Medical Detachments of Units of Various Arms and Services.** a. *General.* The basic function of a medical detachment, regardless of the unit to which it is attached, is to provide primary medical care and treatment. For this reason the general principles of organization and employment of attached medical personnel are the same in units of all arms and services. However, while the function is invariable, the methods of discharging that function depend upon the situations created by the tactical employment of the unit. These, in turn, are governed by the special characteristics of the unit or the general characteristics of the arm or service to which it belongs. These variations in situations and methods require appropriate modifications of the internal organization of the sections of unit medical detachments.

b. *Infantry.* (1) *Rifle units.* (a) The characteristics of Infantry that influence the organization and employment of its medical service are as follows:

1. The battalion is the basic tactical unit. It may operate over relatively large areas, and occupy frontages varying between 500 and 3,000 yards.

2. Normally, Infantry is exposed to the fire of all types of weapons and to air action.

3. The casualty rate of Infantry is usually higher than any other arm or service.

4. Infantry must be able to maneuver and to fight over all kinds of ground.

(b) The material in this chapter is based primarily upon the medical detachment of the infantry rifle regiment. The principal difference in the organization of this detachment from that of others lies in the larger number of litter squads which are required by the special characteristics of infantry combat.

(2) *Mechanized and armored units.* See *g* below.

c. *Cavalry.* (1) *Horse cavalry.* (a) The characteristics of

horse cavalry that influence the organization and employment of its medical service are as follows:

1. The squadron is the basic tactical unit. It is a smaller organization than the infantry battalion.

2. *Mobility.* The essence of cavalry action is maneuver. All services with Cavalry must be highly mobile.

3. Cavalry frequently operates at considerable distances from supporting troops.

4. The casualty rate is, in general, less than that of Infantry. Cavalry is not designed to assault strongly defended positions nor to make a determined defense against strong attacks by Infantry.

5. Cavalry fights mounted and dismounted.

6. Animals are the principal means of transportation of horse Cavalry.

(b) The organization and employment of medical detachments of units of horse Cavalry follow, in general, that of medical detachments of infantry units. The smaller size of the detachments, and the rapidity of movement and dispersion of the elements of cavalry units, make the collection and evacuation of casualties difficult. The only favorable factor is that casualties are rarely as heavy as in infantry units. The principal features of medical detachments of cavalry units that distinguish them from those of infantry units are as follows:

1. *Litter squads.* The smaller size of the squadron sections permits not more than one litter squad per section if an aid station be operated. Otherwise, additional litter squads may be formed from aid station personnel.

2. *Aid station.* It is rarely feasible to establish an aid station in a mounted action, and it may not be practicable to establish one in a rapidly moving dismounted action. First aid is rendered on the field; wounded troopers able to ride are directed to the rear, while those unable to ride are assembled along the axis of movement to be evacuated by a supporting echelon.

3. *Evacuation.* Evacuation may be difficult. The operations may be at such a distance, movement so rapid, or terrain such that supporting medical echelons cannot maintain contact. Lines of communication may be interrupted. In these events, casualties must be either carried with the command or abandoned—in the latter case, in friendly hands if possible. To lessen the dependence of medical detachments upon supporting echelons, and to facilitate the removal of casualties from the field, one field ambulance is provided for the detachment of each regiment of horse Cavalry.

4. *Veterinary service.* The medical detachment of a regiment of horse cavalry includes a veterinary section.

(2) *Mechanized elements.* See g below.

d. *Field Artillery.* (1) The characteristics of Field Artillery that influence the organization and employment of its medical service are as follows:

(a) The battalion is the basic tactical unit. When it is a part of a large force of artillery, the area assigned the battalion is relatively small, and within the battalion area

the batteries are usually echeloned only sufficiently to avoid too compact a target. (See FM 6-20.)

(b) When in position, field artillery units are rarely exposed to small arms fire.

(c) The casualty rate is less than that of Infantry, and casualties tend to occur at irregular intervals. The damage to its matériel makes it desirable, in the absence of other considerations, for an artillery unit to change its position when effective fire is brought to bear against it.

(d) A battalion position is a relatively fixed arrangement. Artillery does not maneuver while actually engaged. Change of position is a definitive operation, and tactical employment ceases during movement.

(e) The majority of artillery positions are often farther to the rear than collecting stations.

(f) Some artillery is transported by pack animals.

(2) The organization and employment of medical detachments of field artillery units reflect these characteristics in:

(a) *Litter squads.* With one exception, battalion medical sections in field artillery units do not include permanent litter squads. The compact battalion position makes the distances between battery positions and the aid station relatively short, and casualties can be carried this distance by battery aid men with or without assistance from artillery personnel. The organic ambulances ((c) below) may be used for this purpose if distances are great and their use is practicable. Searching of the field for wounded is rarely required. The one exception is that the battalion medical sections of the 75-mm gun regiments are large enough to permit of the detail of four men as a litter squad.

(b) *Aid station sites.* The general requirements of a site for an aid station are the same as those of Infantry. However, the location of the aid station is governed by different considerations. It should be conveniently located either within or immediately adjacent to the battalion position.

(c) *Evacuation of aid stations.* The fewer casualties and the relatively greater stability of the aid stations permit casualties to be prepared better in field artillery aid stations for evacuation than ordinarily is feasible in the aid stations of infantry units. For this reason, as well as the fact that it would frequently require a forward movement of casualties, the casualties of a field artillery aid station rarely pass through a collecting station but are evacuated directly to the clearing station. Field artillery aid stations may be evacuated on call by ambulances of the division medical unit. However, motor ambulances are organic equipment of all medical detachments of field artillery units, allotted on the basis of one per battalion medical section. With this equipment the medical detachments of field artillery units should evacuate their own aid stations.

(d) *Veterinary service.* In units of horse, horse-drawn, and pack artillery, a veterinary section is a component part of the unit medical detachment.

e. *Antiaircraft artillery.* The principles laid down for the

medical service of Field Artillery apply, in general, to the medical service of antiaircraft artillery. (See *d* above.) Unless antiaircraft artillery be plentiful, the dispersion of the units will ordinarily be greater than in the case of Field Artillery with reference both to battalions and to batteries within a battalion. This dispersion adds to the difficulties of medical service; but this disadvantage is somewhat offset by the lower casualty rate. Antiaircraft units also may profit by incidental medical service furnished by other units in the immediate vicinity. The larger batteries are provided with three battery aid men instead of the usual two.

*f. Combat engineers.* (1) *Characteristics.* Combat engineer units function primarily in engineering missions, but they may also engage in combat in the role of Infantry. Both battalions and companies are smaller than their Infantry prototypes.

(2) The *organization* of the medical detachment of a combat engineer unit is designed to serve the unit in its primary function. Battalion sections are small, and only one company aid man is furnished each company in the usual situation. The *employment* of the detachment depends upon the employment of the engineer unit:

(a) *In engineering missions.* The unit is frequently dispersed—even companies and platoons being separated. The scattered elements obtain incidental medical service from other units in their vicinities, and regimental or battalion dispensaries are operated at the headquarters.

(b) *In combat missions.* The medical service is exactly like that of Infantry. The small size of the detachment makes it necessary that it be reinforced, particularly with litter bearers, when it engages in combat. Ordinarily, the only source of reinforcements will be the engineer unit.

*g. Mechanized armored and motorized units.* (1) The *characteristics* of mechanized forces that influence the organization and employment of their medical service are:

(a) Great mobility, both on roads and cross country.

(b) Wide radii of operations. Such units may operate as far as 150 miles or more from a base.

(c) Insecure communications. When operating at a distance from supporting elements, lines of communication may be temporarily interrupted.

(d) Maneuver is the essence both of combat and of security. Combat is followed by movement.

(e) Personnel for the most part maneuver or fight in armored vehicles.

(f) Their tactics are almost invariably offensive. Even though the general nature of the operations be defensive, mechanized elements are ordinarily employed offensively.

(2) The *organization and employment* of the medical detachments of mechanized and armored units reflect these characteristics in directing the principal efforts at first aid either in the vehicles or on the field, and carrying the casualties with the command in combat or other vehicles until they can be evacuated with safety. Aid stations are ordinarily established at the location of the maintenance vehicles.

Cross country ambulances are organic equipment of medical detachments.

*h. Other arms and services.* Other medical detachments in the division operate dispensaries at or near their unit headquarters and may provide company aid men to the companies of their unit. All scattered elements obtain incidental medical service from other units in their vicinities.

**342. Medical Detachments of Separate Battalions.** The principles of organization, administration, supply, employment, and training of medical detachments of regiments, set forth in this chapter, apply also to the medical detachments of units other than regiments. Since the battalion medical section is the primary operating unit of attached medical personnel, no further permanent subdivision of a medical detachment is permissible, although medical personnel may be temporarily attached to units smaller than a battalion. The medical detachment of a separate battalion or comparable unit is, therefore, organized as a battalion medical section with the addition of the overhead required for administration and supply. This overhead, however, is available for other duty. The surgeon of a separate battalion or comparable unit has the combined responsibilities and duties of a regimental and a battalion surgeon.

## DIVISION MEDICAL SERVICE

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SECTION I  
ORGANIZATION

**343. Definitions.** The medical service of a division consists of two echelons: the attached medical personnel and the division medical service. The operations of attached medical personnel are controlled by subordinate unit commanders. The division medical service is operated directly under division control. In the several types of divisions it consists of:

*a. Square infantry division.* A division surgeon's office and one medical regiment (division).

*b. Triangular infantry division.* A division surgeon's office and one medical battalion.

*c. Cavalry division.* A division surgeon's office and one medical squadron.

*d. Armored division.* A division surgeon's office and one medical battalion.

**344. Doctrine of Employment.** The following doctrines govern the organization and operation of division medical service:

*a. Close support of attached medical personnel.* Attached medical personnel furnish a continuous medical service to the subordinate units of the division. However, both the scope and the capacity of this service are limited, and prompt evacuation of noneffectives is vital to the effective operation of unit medical detachments.

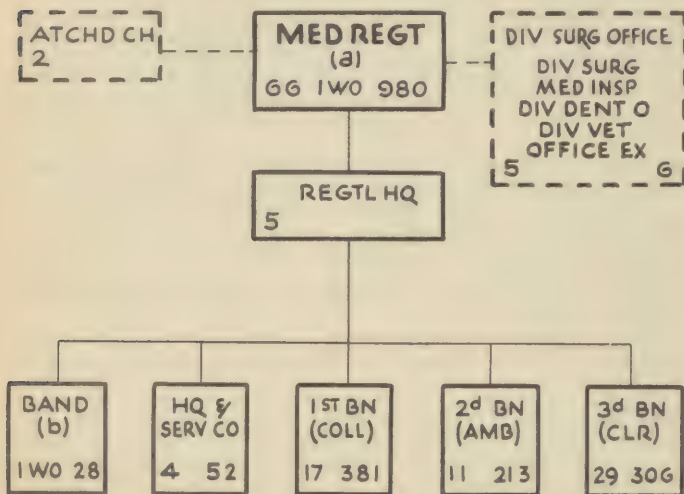
*b. Mobility.* Since the impetus of evacuation is from the rear, support of a forward element is impossible unless the supporting echelon be equally mobile, and relatively ineffective unless the supporting echelons have greater mobility. The mobility of collecting units must be comparable to that of the battalions or squadrons they are designed to support. The mobility of clearing units must be comparable with that of brigades or similar units. When, in the interest of the sick and injured, the mobility of a medical unit must be sacrificed to technical requirements, as in the case of evacuation hospitals, the mobility of the service rendered by such units is maintained by increasing their number and displacing them by echelon as the need arises.

*c. Flexibility.* While the advantages of standing operating procedure are recognized, this phrase must not be construed as imposing rigidity upon the operation of medical service.

*d. Economy of force.* No more troops should be committed, and no more installations should be established, than are required for the task at hand or the obvious needs of the immediate future. Once committed, considerable time is required to make a unit available for other employment; and

the establishment of a station immobilizes that unit for a period, the length of which will depend upon the elaborateness of the station and the number of casualties therein.

*e. Attachments to subordinate forces.* Whether the division medical service will be operated exclusively under central control, or whether a portion will be attached to a subordinate force, is determined by each situation. If adequate control can be maintained by central authority, no attachments should



(a) One medical regiment per infantry division "square."

Three medical regiments per type army.

Army surgeon's office replaces division surgeon's office when serving as army medical regiment.

Division surgeon commands medical regiment in infantry division.

(b) Only when specifically authorized.

Figure 111. Functional Organization of the Medical Regiment.  
T/O 8-21, Nov. 1, 1940.

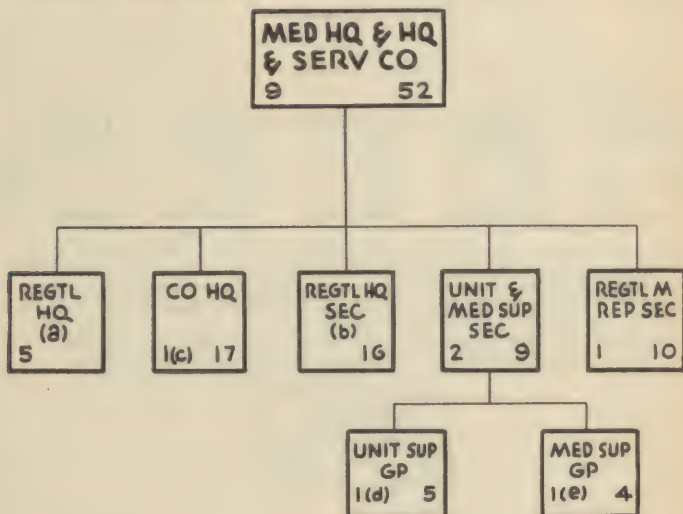
be made. However, if certain elements of the division, such as a reinforced brigade or an infantry-artillery combat team, are operating at such a distance from the bulk of the division installations that effective control is difficult, a suitable fraction of the division medical service should be attached to that force.

**345. Organization.** *a. Medical regiments, battalions, and squadrons.* (1) *Division medical regiment* (square division). The medical regiment of a square division consists of a headquarters, a band, a headquarters and service company, and three battalions of three companies each. For details, see T/O 8-21.

(a) *Headquarters.* The regimental headquarters con-

sists of the regimental commander (who is also the division surgeon) and his staff. Enlisted personnel are provided from the headquarters and service company. Regimental headquarters is not to be confused with the division surgeon's office; they are separate and distinct organizations, and usually located at different places.

(b) *Band.* The band is a standard regimental band of 1 warrant officer and 28 enlisted musicians.

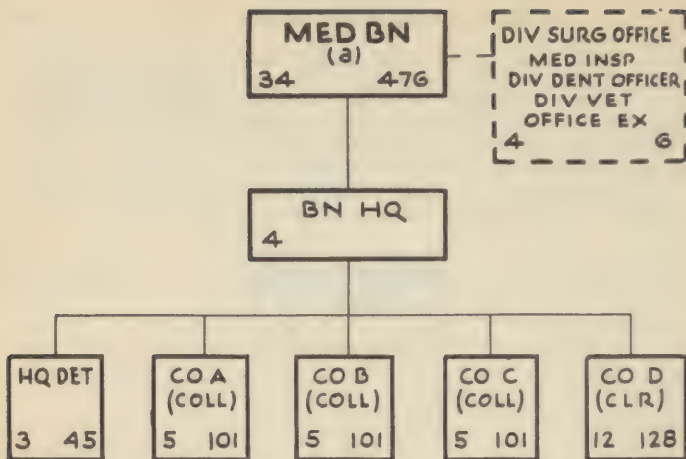


- (a) Regt'l hq.  
C O (also div surg).  
Ex O.  
S-3.  
Adj.  
Asst S-3.
- (b) For duty with regt'l hq.
- (c) Unit sup O, Med O and Regt'l S-4.
- (d) Asst unit sup officer.
- (e) Asst med sup officer.

Fig. 112. Functional Organization of the Headquarters and Headquarters and Service Company, Medical Regiment. T/O 8-22, Nov. 1, 1940.

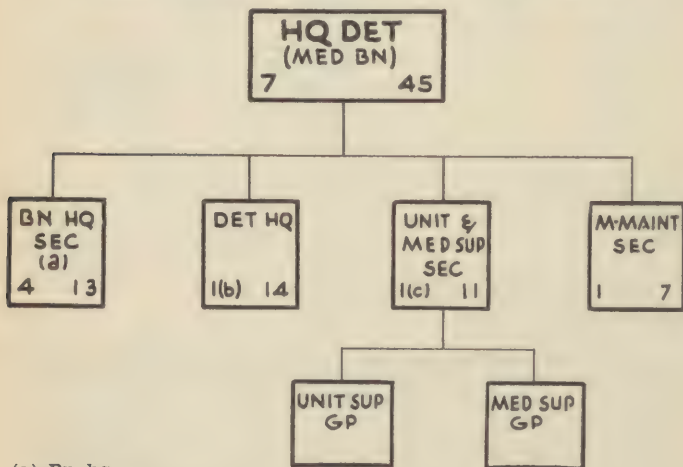
(c) *Headquarters and service company.* This is the administrative and supply unit of the regiment. It comprises:

1. The enlisted overhead for the regimental and three battalion headquarters;
2. The organization for the general and medical supply of the regiment;
3. The organization for the medical supply of the entire division;



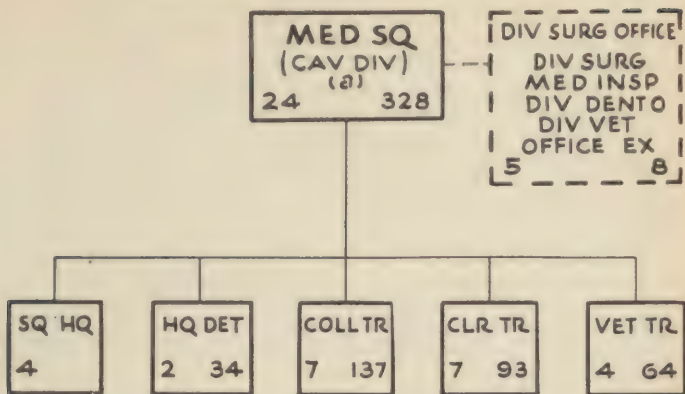
- (a) One medical battalion per infantry division, "triangular."  
 One medical battalion per type corps.  
 Division surgeon commands medical battalion in infantry division.  
 Division surgeon's office replaced by corps surgeon's office when  
 serving as corps medical battalion.

Figure 113. Functional Organization of the Medical Battalion,  
 Infantry Division, Triangular. T/O 8-65, Oct. 1, 1940.



- (a) Bn hq.  
 C O (Also div surg).  
 Ex O.  
 S-3.  
 Adj.  
 (b) Unit sup O, Med sup O and Bn S-4.  
 (c) Asst unit sup O and Asst med sup O.

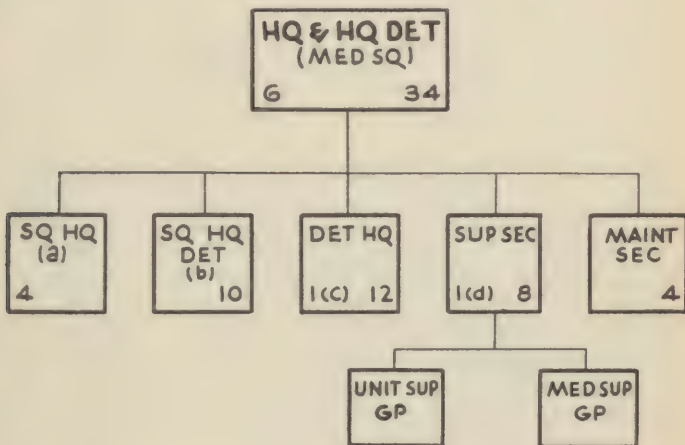
Figure 114. Functional Organization of the Headquarters  
 Detachment, Medical Battalion, Infantry Division, Triangular. T/O 8-66, Oct. 1, 1940.



Division surgeon commands medical squadron.

(a) One medical squadron per cavalry division.

Figure 115. Functional Organization of the Medical Squadron, Cavalry Division. T/O 8-85, Nov. 1, 1940.



(a) Sq hq.  
C O (Also div surg).  
Ex O and S-3.  
Ch.  
Adj.

(b) For duty with sq hq.

(c) Unit sup O, med sup O and sq. S-4.

(d) Asst unit sup O and asst med sup O.

Figure 116. Functional Organization of the Headquarters and Headquarters Detachment, Medical Squadron.

T/O 8-86, Nov. 1, 1940.

#### 4. The regimental motor repair section.

It has no functions directly connected with the care or evacuation of casualties.

(d) *First battalion.* The first battalion is composed of a headquarters and three collecting companies.

1. The headquarters consists of the battalion commander and one commissioned assistant; the enlisted force for the battalion headquarters is furnished by the headquarters and service company. For further details, see T/O 8-25.

2. *Collecting company.* The three collecting companies are designated A, B, and C, respectively. Each consists of a company headquarters and three platoons. The first platoon comprises a collecting station section and a liaison section; the second and third platoons are litter bearer platoons.

(e) *Second battalion.* The second battalion is composed of a headquarters and three motor ambulance companies.

1. The headquarters is organized like that of the first battalion ((d) above). For further details, see T/O 8-35.

2. *Motor ambulance company.* The three companies of this battalion are designated D, E, and F, respectively. Each consists of a company headquarters and two platoons of motor ambulances.

(f) *Third battalion.* The third battalion is composed of a headquarters and three clearing companies.

1. The headquarters is organized like that of the First Battalion ((d) above). For further details, see T/O 8-45.

2. *Clearing company.* The three companies of this battalion are designated G, H, and I, respectively. Each consists of a company headquarters and three platoons. The first platoon is the technical platoon, the second is the ward platoon, and the third is the transportation platoon.

(2) *Medical battalion (triangular division).* The organizations of the medical battalion of a triangular division comprise a headquarters, detachment medical battalion, three collecting companies, and one clearing company. For further details, see T/O 8-65.

(a) *Headquarters detachment, medical battalion.* The headquarters detachment is made up of the following sections.

1. Battalion headquarters section.
2. Detachment headquarters.
3. General and medical supply sections.
4. Motor maintenance section.

(b) *Collecting companies.* The medical battalion has three collecting companies. Each consists of a company headquarters, a collecting station platoon, and a collecting platoon. The collecting platoon is subdivided into bearer and ambulance sections. The bearer section consists of a platoon headquarters, which includes the liaison agents, and

three bearer sections. Each ambulance section is furnished twelve ambulances.

(c) *Clearing company.* The clearing company consists of a company headquarters and two clearing platoons.

(3) *Medical squadron.* The medical squadron of a cavalry division consists of a headquarters, a headquarters and service detachment, a collecting troop, a clearing troop, and a veterinary troop. For details, see T/O 8-85.

(a) *Headquarters.* The headquarters consists of the squadron commander, who is also the division surgeon, and his staff. Enlisted personnel are furnished by the headquarters and service detachment.

(b) *Headquarters detachment.* This detachment consists of three sections: a headquarters section which furnishes the enlisted overhead for the squadron headquarters, a general and medical supply section, and a motor maintenance section.

(c) *Collecting troop.* The collecting troop consists of a headquarters and two collecting platoons. Each platoon is organized into a collecting station section, a bearer section, and an ambulance section.

(d) *Clearing troop.* The clearing troop consists of a headquarters and two clearing platoons. Each clearing platoon is organized into a technical section, a ward section, and a transportation section.

(e) *Veterinary troop.* The veterinary troop consists of a headquarters, a clearing platoon, and two collecting platoons.

(4) *Medical battalion, armored division.* The medical battalion of an armored division consists of a headquarters, a headquarters detachment, a collecting company, and a clearing company. For details, see T/O 8-75.

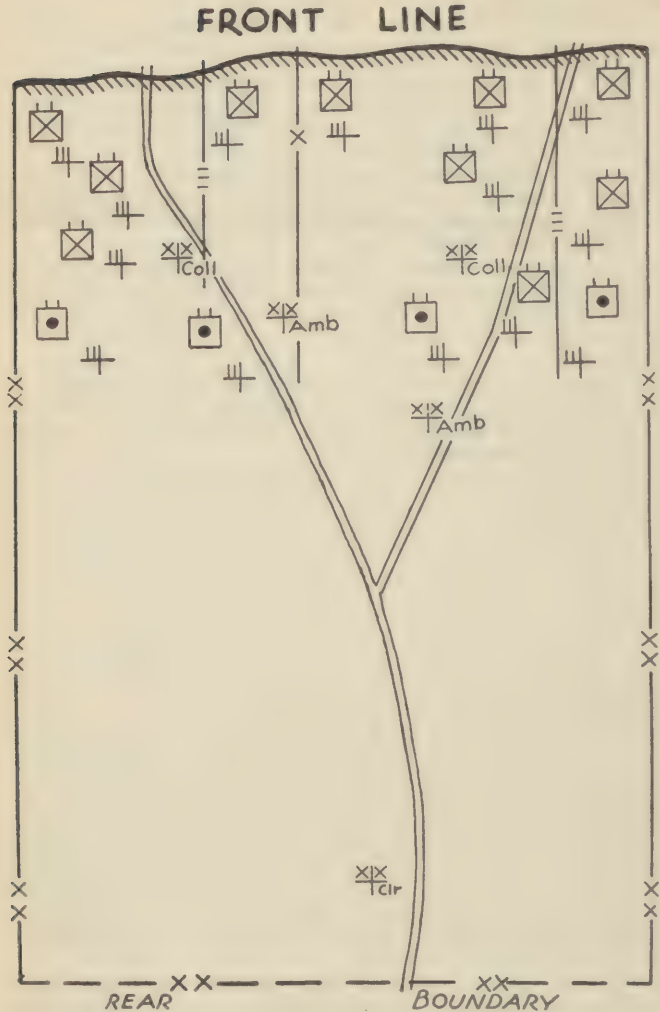
(a) *Headquarters.* The headquarters consists of the battalion commander, who is also the division surgeon, and his staff. Since the division surgeon's office is an administrative office distinct from the medical battalion and located at division headquarters, enlisted personnel therefor is provided by the armored division headquarters. (See T/O 17-1.)

(b) *Medical headquarters and headquarters detachment.* This detachment consists of four sections; a headquarters section to furnish the enlisted overhead for the battalion headquarters, a battalion headquarters section, a supply section, and a maintenance section.

(c) *Collecting company.* The collecting company consists of a headquarters and two collecting platoons. Each platoon is organized into a platoon headquarters, an ambulance section, and a litter bearer section.

(d) *Clearing company.* The clearing company consists of a headquarters and two clearing platoons. Each clearing platoon comprises a platoon headquarters, a technical section, a ward section, and a transportation section.

**346. Equipment.** a. *Classification.* The equipment of an



(Not drawn to scale. Note that one collecting company and one ambulance company is supporting each brigade combat team, and that the clearing unit(s) is (are) supporting the entire division.)

**Figure 117. Schematic Representation of Medical Service of Infantry Division (Square) in Combat.**

organization is divided into individual equipment and organizational equipment.

b. *Individual equipment.* All officers of the Medical, Dental, and Veterinary Corps, and all enlisted men of the Medical Department, carry on their persons special equipment for the first aid treatment of sick and injured men or animals. This equipment is specialized to meet the needs of medical, dental, and veterinary service. Corresponding with the degrees of technical training, the individual equipment of officers is more elaborate than that of noncommissioned officers; and that of the latter is more elaborate than the individual equipment of privates.

c. *Organizational equipment.* The equipment of an organization is both general and special. The general equipment is that used in the general functions common to all military organizations, and the special equipment is that provided for the special functions of the unit.

(1) *Headquarters companies.* The battalion headquarters companies and headquarters and service companies have no medical equipment. Their functions are administrative rather than concerned with the care of patients. The division medical supply sections of these companies carry a small rolling reserve of medical supplies for the entire division. The companies are equipped with motor transport and with special equipment required for its maintenance.

(2) *Collecting companies.* The special equipment of a collecting company consists of a limited amount of tentage for the shelter of casualties; chests of instruments, medicines, dressings, blankets, and simple foods for the emergency care and treatment of the sick and injured; and litters upon which to transport those unable to walk. While this equipment is designated only for simple technical procedures, it is ample enough for the company to initiate combat and to furnish replacements of dressings to battalion aid stations in its front until the division medical supply system can be placed in operation. The company has the necessary motor vehicles to transport its equipment.

(3) *Ambulance companies and platoons.* Ambulance units have a supply of litters, blankets, and splints solely for property exchange. They have no unit medical equipment for their own use. Their special equipment consists largely of ambulances.

(4) *Clearing companies and platoons.* The special equipment of clearing units includes tentage, cots, and chests of instruments, medicines, dressings, blankets, and foods for the temporary care and emergency treatment of the sick and injured. While the medical equipment of these units is somewhat more elaborate than that of collecting units, it is sufficiently simple to be readily transportable and too limited to provide for involved technical procedures. Motor transport is provided for personnel and equipment.

**347. Installations.** When a medical unit establishes its temporary installation for combat and is ready to function, it is said to be *at station*. The installation is designated generically as a *station*, and specifically by the function it performs;

e. g., aid station, established by sections of medical detachments; collecting station, ambulance station, and clearing station. A service station is established by the supply sections of the headquarters, or headquarters and service, company of the division medical unit.

**348. Division Surgeon. a. General.** The senior officer of the Medical Corps assigned to a division is the division surgeon. The fact that this same officer is also the commander of the division medical unit must not be permitted to obscure the sharp distinction between his functions in the two capacities. As division surgeon he is a special staff officer of the division commander, and all his duties and responsibilities are staff functions. As commander of the division medical unit, his functions are exclusively those of command.

## SECTION II

### COLLECTION

**349. Definitions.** *a.* Collection is the operation of removing casualties from aid stations, or directly from the field when necessary, to a collecting station and there preparing them for further evacuation. It should be noted that this preparation for further evacuation is an essential feature of collection.

*b.* A collecting station is a complete establishment of a collecting unit—complete in the sense of availability of all the normal facilities of a collecting station. Certain collecting units have duplicate sets of equipment permitting them to establish two complete stations. In the latter case the personnel available to operate each station is proportionately reduced.

*c.* A collecting post is a limited establishment operated by a detachment of a collecting unit and contains the necessary elements to prepare casualties for further evacuation, but with less elaborate degree than a collecting station.

**350. Collecting Units.** *a. Functions.* A collecting unit has the following functions:

(1) *Combat function.* The combat function of a collecting unit is to provide direct support of the attached medical personnel in its front. This support consists of the collection of casualties, their sorting, emergency treatment, and transfer *at the collecting station or post* to the ambulance unit in support. In the case of collecting units which include ambulance platoons, this transfer of responsibility is made at the clearing station.

(2) *Supervision of sanitation.* When not confronted with actual or impending combat functions, collecting units provide the personnel to assist in sanitary administration in the manner prescribed in paragraphs 5 and 6, AR 40-205.

*b. Functional organization.* Each collecting unit is organized into a unit headquarters, collecting station section, liaison agents, and litter bearers. An ambulance subunit is included in certain collecting units.

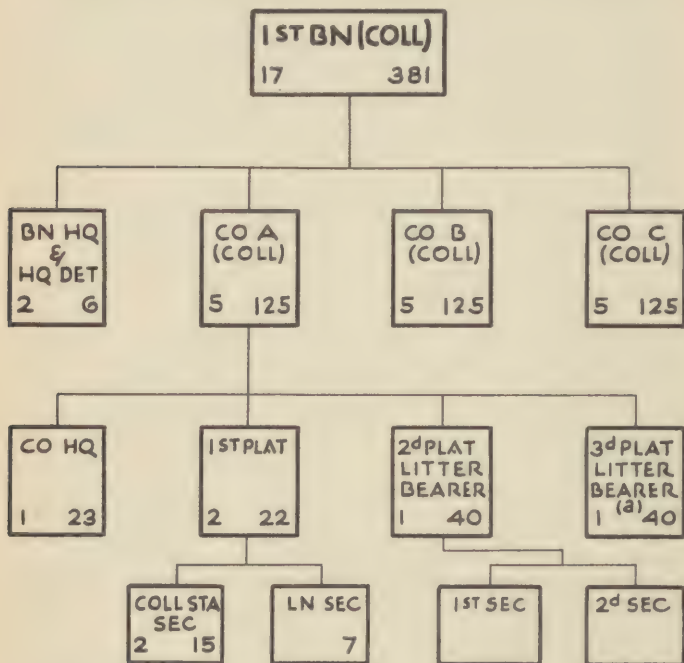
(1) *Unit headquarters* consists of such commissioned and enlisted personnel as are required for the command and administration of the unit as a whole. It maintains at all times a small office for the administration and maintenance of the unit including the preparation of reports, returns, requisitions, and correspondence.

(2) *Each collecting station section* is charged with the establishment and operation of a collecting station. When at station this section is reenforced as necessary.

(3) *Liaison sections* are charged with the establishment and maintenance of liaison (contact) with the medical detachments attached to combat units in the zone of action covered by the collecting unit.

(4) *Litter bearers* carry litter cases to the collecting station from the aid station and, when necessary, from the field in rear of the battalion aid stations in their zones of action. They operate the unit's wheeled litter carriers whenever their use is practicable. They perform such first aid for casualties handled by them as may be necessary.

**351. Collecting Unit Commander.** *a. General.* The senior officer of the Medical Corps present for duty with a collecting unit commands it. Collecting units are the critical elements of the division medical service; and commanders of these units must be able, alert, resourceful, courageous, and industrious.



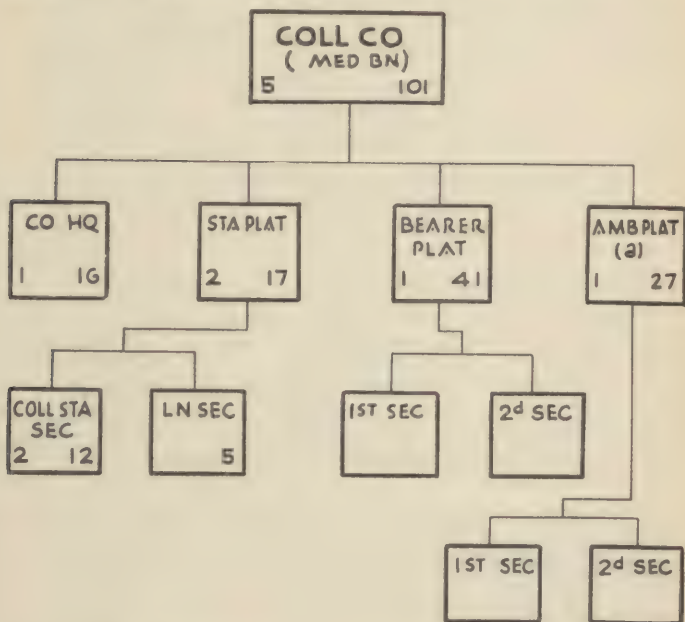
(a) Same as 2d plat.

**Figure 118. Functional Organization of the 1st Battalion (Collecting), Medical Regiment. T/O 8-25, Nov. 1, 1940.**

*c. Relations with other units.* (1) *Within the division medical service.* In combat there must be close and harmonious cooperation between the collecting unit and the ambulance unit directly supporting it. The ambulance unit, however, must adapt its operations to those of the collecting unit except that the collecting unit must establish its stations near points accessible to ambulances.

(2) *Without division medical service.* The collecting unit must base its dispositions and operations upon those of the combat elements in its front. Normally it removes casualties from aid stations; but, when attached medical personnel for any reason have been unable to remove all wounded from the field, the collecting unit must search and clear the field.

**352. Message Center.** *a. General.* The message center is the nerve center of the unit. All official messages to and from the unit pass through the message center and are made of record. It is located at the unit CP, and marked with a conspicuous sign. The message center clerk is in direct charge of operation.



(a) 12 Amb, cross country.

Figure 119. Functional Organization of a Collecting Company, Medical Battalion, Triangular Division, T/O 8-67, Oct. 1, 1940.

*b. Equipment.* The essential equipment of a unit message center consists of:

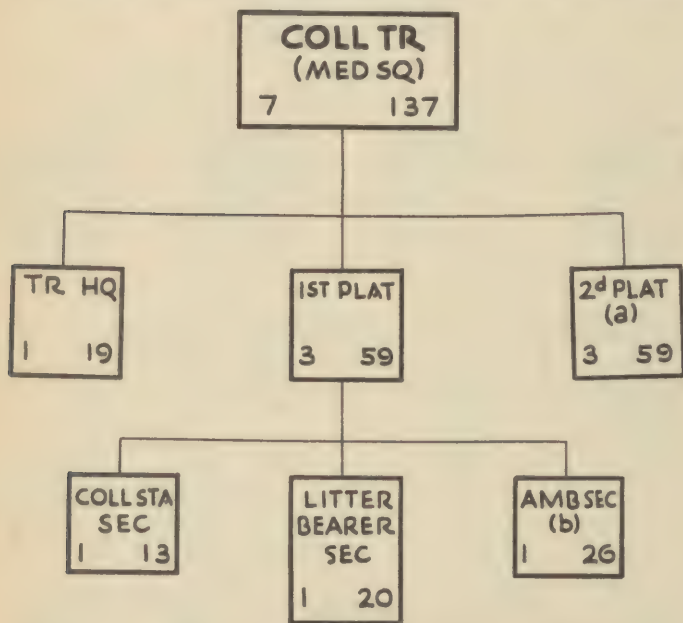
- (1) A small table and stool.
- (2) Blank delivery lists.
- (3) Field message blanks.
- (4) Carbon paper, pencils.
- (5) Registration stamp and ink pad.
- (6) Blank message center registers (W. D., S. C. Form No. 1150).
- (7) Flashlight, lantern.
- (8) Time piece.
- (9) Message center case (for equipment).
- (10) Message center directing sign.
- (11) A simple file for communications, delivery lists, and message center register sheets.

*c. Special combat functions.* Message center personnel

meet incoming litter bearers and walking wounded from the front, and ambulances from the rear, and ascertain by direct questions whether or not they are bearers of messages. Messages for the collecting unit are retained; those for units in front or in the rear are forwarded by the proper agencies.

d. *Records.* The records of the message center should be complete. (See FM 101-10.)

353. **Locating Collecting Station.** a. *General.* The site of a collecting station is selected from a study of the terrain,



(a) Same as 1st plat.

(b) 12 Amb. cross country

Figure 120. Functional Organization of the Collecting Troop, Medical Squadron, Cavalry Division. T/O 8-87, Nov. 1, 1940.

roads, friendly and hostile troop dispositions, and the capabilities of the enemy. The governing element is the *mission* of a collecting unit: *the preparation of casualties for ambulance transportation to the clearing station.* Many patients arrive at a collecting station who have not been given adequate emergency treatment; but none should ever *leave* a collecting station with an inadequate dressing, a poorly splinted fracture, or lacking sufficient blankets to protect him from the weather. These functions cannot be discharged unless some degree of protection from enemy action is afforded; this consideration points to a site well to the rear. However, the difficulties in transporting patients on litters carried by hand,

and the suffering of walking wounded, point to a site near the front. Selection of the site, then, becomes a compromise between these divergent considerations. The most important factor in determining the location for a collecting station is the position of the several aid stations supported by the unit. This requires a map study or reconnaissance of the belt of terrain some 500 yards to the rear of the line of departure or the main line of resistance in order to determine the location of aid stations and a knowledge of probable or actual battalion boundaries. (See fig. 117.) The latter information frequently can be obtained in advance in the case of a prepared attack or a prepared defensive position. In a meeting engagement, such advance information of combat elements may not be available but usually fairly accurate deductions may be made. In such situations, it may be advisable to order the collecting unit to a position in readiness initially, from which it can be rapidly advanced to the best position after the tactical situation has developed and the aid stations have been located.

*b. Site requirements.* (1) The station should be located so as to obtain sufficient defilade from elevations of terrain for protection from direct small arms fire and from flat trajectory artillery fire. A distance beyond the effective range of hostile artillery fire renders the station useless. Properly located buildings, particularly those of brick, concrete, or stone construction, should be utilized. Cellars provide protection, and in stabilized situations dugouts may be constructed. Protection may also be obtained by concealment. Positions in woods or other localities which are not under direct enemy observation should be sought.

A location in close proximity to bridges, fords, important crossroads, ammunition distributing points, battery positions, or other points likely to draw hostile artillery fire should be avoided.

(2) Every effort must be made to reduce to a minimum the distance of litter carry. The average should not be more than 1500 yards, and each 100 yards that this average distance is reduced adds to the efficiency of casualty collection. A position somewhere near the center of a zone of action or sector will equalize the distances from the several aid stations and is desirable unless there are urgent reasons to the contrary.

(3) The site selected must be accessible to ambulances, although the station is not necessarily accessible at all times. Demolitions, other traffic, and enemy fire may prevent ambulances from reaching the station for varying periods, and, in extreme situations, ambulances may be able to evacuate the station only at night.

(4) The site must be of sufficient size to permit systematic organization of the station and for the movement of ambulances and trucks. Considerable accumulations of wounded may occur for various reasons and there should be sufficient shelter and cover available while they are awaiting evacuation. **The ground must be firm.**

(5) A point which intercepts the greatest number of natural lines of drift of wounded is desirable.

(6) Probable areas of casualty density must be considered.

(7) The collecting station should not be located so far forward as to become involved in minor fluctuations of the line.

(8) An adequate water supply is desirable.

c. *Average location.* The location of a collecting station will depend in each situation upon the terrain, road net, nature of the operation (attack, defense, etc.), and enemy capabilities. *No fixed rule can be laid down;* but the following approximations may be regarded as general guides:

(1) It should rarely be nearer than 1200 yards to the front line.

(2) It should rarely be farther than 3500 yards from the front line.

(3) Other things being equal, it should be near the center of its zone of action in a lateral direction.

(4) It should be on or near a road leading to the rear.

d. *Reconnaissance.* (1) Depending upon the situation, the general area in which a collecting station is to be established may be prescribed by the commander of the division medical unit or by the commander of the collecting battalion; or the collecting unit may be given a mission in order to support a specified combat element, in which case the unit commander may exercise full discretion. Before the collecting unit arrives in the general area, a reconnaissance should be made by the unit commander, whenever possible, to select the exact location of the collecting station.

(2) Upon arriving at his decision, the unit commander may send a messenger to guide the unit into position, or he may return and lead it in. In either case he should have a detailed plan for the lay-out of the station and the employment of the other elements of his unit by the time it arrives at the site selected.

(3) Whenever practicable, this reconnaissance is made jointly with the supporting ambulance unit commander. The views of the latter must be considered carefully, but the decision rests with the collecting unit commander.

### 354. Establishing a Collecting Station. a. *Approach march.*

(1) *General.* The advance of a collecting unit to its combat position will depend upon the nature of the operation, enemy capabilities, and the location of the unit at the time it receives its mission. Intervening, ordinarily, between the unit and its combat position is the bulk of the combat troops and their trains. These must have priority of movement. Thus an early and uninterrupted advance of a collecting unit to its combat position is not always assured. However, when early entry of collecting units into combat is imperative, this source of delay should be obviated by placing them in such positions prior to combat that their subsequent movements will not interfere with combat troops. In planned operations of large units, however, several hours are allotted for reconnaissances of commanders and staffs and for other necessary preliminaries to combat. During this period a collecting unit usually will be able to make its preparations and advance to its position without interfering with other elements.

(2) *Advance into position.* The personnel of a collecting unit are moved into position whenever practicable by the

ambulance unit designated to support. The train of the collecting unit follows in the column. The ambulances transport the collecting personnel to the site of the station, or as near thereto as the convoy may proceed in relative safety. Except when the ambulance unit is a subordinate element of the collecting unit, this movement is controlled by the ambulance unit commander. Collecting personnel are transported in ambulances both to save time and to start them off in their arduous duties in the best physical condition possible. The combat order for a collecting unit will prescribe the time of movement, the route, the ambulance unit (if any) to transport the personnel, entrucking, and (when known) detrucking points, the hour at which the collecting station will open, if necessary, and such other information as may be required.

*b. Setting up the station.* (1) *Organization.* The station is organized into the following departments: receiving, litter wounded, walking wounded, gas cases (when indicated), records, forwarding, kitchen, and the morgue. For a diagram of the organization and layout, see figure 121.

(2) *Allotment of tasks.* (a) *General.* All departments are established simultaneously. The platoon leader is in general charge; he is assisted by the platoon sergeant.

(b) *Kitchen.* Mess sergeant, cooks, and cooks helpers.

(c) *Message center.* Message center clerk.

(d) *Latrines.* Truck chauffeurs may be used to dig latrines.

(3) *Procedure.* (a) If the unit has been transported to the site by ambulances, it detrucks and forms. The packs of the men, except those in the litter platoons, are unslung and laid aside. The unit commander points out the positions for the headquarters and message center, the receiving, litter wounded, walking wounded, and forwarding departments of the station, the kitchen, morgue, motor park, latrines, and direction of water point; and indicates where the liaison personnel will report to him for orders, if its members have not already reported to the regimental and battalion surgeons.

(b) The officers and noncommissioned officers then take charge of their respective platoons, sections, and details, and establish the station.

(c) The trucks are driven to points most convenient for unloading and placing equipment.

(d) The litter bearers are marched to a nearby point affording some concealment and cover. Packs are unslung; and all equipment in excess of stripped packs is removed from the packs. Stripped packs with medical belts or pouches are then slung. The excess personal equipment is stacked. Litters are procured and stacked. The litter bearers fall out and remain in the immediate vicinity of the stacked litters.

(e) Under the immediate direction of the platoon sergeant, the reinforced collecting station section unloads the station equipment from the trucks. The litters are unloaded first and placed to one side convenient for use by the litter bearers. This detail may pitch the tents for litter and walking wounded. Each tent is then equipped by the enlisted personnel on duty therein, under the supervision of the

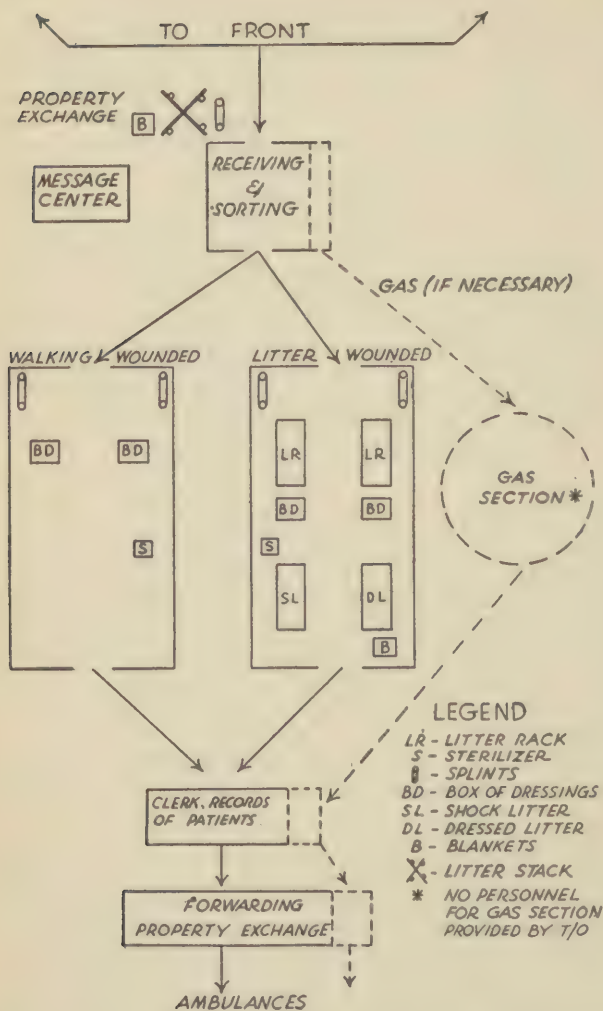


Figure 121. One Arrangement of Collecting Station. Arrangements Vary With Characteristics of Site.

platoon sergeant. Each man arranges and prepares for immediate use the equipment and supplies in accordance with his duty assignment.

(f) After they are unloaded, the platoon sergeant directs the distribution of blankets, litters, and splints to the receiving, litter wounded, and walking wounded departments.

(g) Personnel in the litter and walking wounded departments prepare for the reception of patients.

(h) The forwarding department is established.

(i) The clerk, recorder of patients, takes position prepared to make the necessary record of patients passing through the station.

(j) As soon as the platoon sergeant has personally inspected all departments of the station and ascertained that equipment and preparations are complete and satisfactory, he takes his post in the receiving department.

(k) Under the direction of the mess sergeant, the cooks and cooks helpers unload the equipment and supplies of the station kitchen, pitch the kitchen fly, and start the preparation of hot foods and drinks for patients. This kitchen does not feed the duty personnel. The unit kitchen should be located near but not in the collecting station.

(l) The message center clerk establishes the message center at a designated point, places the proper signs, and takes his post.

(m) As soon as trucks are unloaded, they are driven to a concealed park in the vicinity of the station.

(n) After the trucks are parked, the chauffeurs dig the latrines. As soon as they are finished, they return to the park and await further orders.

(4) *Improvements.* If the station remains in one position several days, its organization, protection, and facilities are improved.

c. *Directing signs.* Upon the establishment of a collecting station, plainly visible directing signs are posted at suitable points to mark the location of the station and the routes thereto. The area forward is adequately posted along the litter-bearer routes as far as the line of the aid stations. A large sign is prominently displayed in the vicinity of the station. The posting and removal of the station sign are the responsibility of the platoon sergeant. The posting and subsequent recovery of the Red Cross directing signs are the responsibility of the sergeant of the bearer element in whose zone of action these signs are posted.

**355. Operating Collecting Station.** a. *General.* The material in this paragraph is to be construed merely as a general guide to the operation of a collecting station. The functions discussed herein must be discharged in every situation; but circumstances may require some modification of the manner in which they are discharged.

b. *Receiving department.* All cases enter the station through this department. A supply of blankets, litters, and splints is maintained for exchange with litter bearers. Each patient is examined and classified either as a walking wounded or a litter wounded. Experience has shown that roughly 50 per

cent of all cases received will fall into each of these classes. If gas is used, a further classification must be made to separate gassed patients from all others. As soon as a patient is classified in this department, he is sent to the proper department for emergency treatment and preparation for further evacuation.

*c. Litter wounded department.* (1) In general, litter wounded will require more attention than walking wounded, although a relatively slight injury to a foot may prevent a patient from walking and this department is organized accordingly. If the personnel is available, this department should be manned by two medical officers and six enlisted men. Of the latter, there is one noncommissioned officer in general charge; one enlisted man in charge of sterilization and the administration of hypodermic medication, including sera; one enlisted man in charge of shock litters; one in charge of dressed litters; and two (technicians) to assist the medical officers.

(2) Two dressing tables are operated, one by each medical



(This sign may be painted on a suitable panel with the additional legend "To Collecting Station" or "To Clearing Station," or whatever the installation may be, and mounted on a post or tree or other object.)

Figure 122. For Signs Pointing Way to Medical Installations.

officer and his assistant. Dressings and splints are placed conveniently. Only the simplest and most necessary operative procedures are undertaken. Tourniquets must be removed and hemorrhage stopped if possible before the patient is evacuated.

(3) A section of the litter wounded department is devoted to the treatment of traumatic shock. A shock litter is prepared by placing an ordinary litter on a litter rack with blankets so arranged as to inclose the space beneath the litter, in which are placed lanterns. When lighted, these lanterns provide heat to a patient placed on the litter. Additional heat may be provided with blankets and the judicious use of hot water bottles.

(4) Working to the rear of the dressing tables is an enlisted man charged with sterilizing instruments and administering hypodermic medication. An important duty of this man is to examine the emergency medical tag of each patient and, if the administration of any serum is routine, to determine whether or not it has been administered previously; and, if it has not already been administered, to give the patient the prescribed dose, making a proper notation of his action. He administers other hypodermic medication at the

direction of a medical officer and makes the proper notations of such action.

(5) Several litters are *dressed* with blankets to be available without delay when needed. For the method of dressing a litter, see FM 8-35.

d. *Walking wounded department.* This department is operated similarly to the litter wounded department except that no provisions are made for the treatment of shock and no dressed litters are maintained. One medical officer with enlisted assistants usually operates this department.

e. *Gas department.* If gas is used by the enemy, special provision must be made at the collecting station for gassed cases. They must not be mixed with other patients, and they usually require special treatment. While these cases must receive treatment at the collecting station, the meager equipment and limited personnel will not permit of more than the minimum of ameliorative measures being taken. Degassing of mustard cases and suspected mustard cases is undertaken when practicable. In good weather, this department should be operated in the open. Personnel must observe protective measures. If gas casualties are numerous, collecting units must be reinforced to afford proper care to such cases. Specially trained personnel and suitable equipment should be provided.

f. *Record department.* A clerk, recorder of patients, keeps a numerical record of all patients received at the collecting station, classified as indicated in FM 8-45. A report is submitted through the message center to the next higher headquarters at such intervals as may be directed, usually every 4, 6, or 12 hours, depending upon the situation.

g. *Forwarding department.* (1) As soon as the treatment of each patient is completed, he is removed to the forwarding department. Although not separated by any great distance, to facilitate the loading of ambulances, walking wounded are kept apart from litter wounded in this department. While awaiting evacuation, patients, especially the seriously sick and injured, must be provided with some shelter if the weather is cold or inclement.

(2) The enlisted man in charge of the forwarding department directs the loading of ambulances, checks the exchange of property, and separates the patients into those who are to be evacuated and those who are to be returned to their organizations. The latter he turns over to the military police, or disposes of in accordance with special instructions. The former he classifies as shown below, and sees that ambulances are loaded accordingly:

(a) Those who must be transported in a recumbent position. These are not to be confused with litter wounded, since certain litter wounded may be transportable in a sitting position.

(b) Those who may be transported in a sitting position.

(c) Those who must be transported apart from others, such as gassed patients and those with contagious diseases.

(3) The equipment of evacuees may accompany them, or may be disposed of at a salvage dump established at the col-

lecting station. This is determined by policies established by the division commander.

(4) The loading of ambulances is controlled by the collecting unit. All ambulances are loaded to capacity when evacuation is heavy. Except in emergencies, ambulances are held at the forwarding department until a full load is assembled.

*h. Kitchen.* When the station is opened, the cooks immediately prepare an adequate supply of hot coffee, cocoa, or soups for cases awaiting treatment or evacuation.

*i. Morgue.* This is merely a place, out of the sight of the wounded, where those who die at the station are placed until they can be properly disposed of by the agency responsible for burial.

**356. Liaison Section.** *a. Responsibility for liaison.* In the medical service the responsibility for maintaining contact between two medical units lies with the unit to the rear. Although regimental and battalion surgeons have a duty in this connection, the responsibility for establishing and maintaining contact between attached medical personnel and the collecting unit in support lies with the latter. To discharge this duty there is, in each collecting unit, a liaison section composed of contact agents.

*b. Duties of contact agents.* The basic functions of contact agents (*c* below) are:

(1) To locate all infantry aid stations in the collecting company's assigned area of responsibility. Contact agents are not usually assigned to artillery units.

(2) To return to the collecting station and guide the litter bearers forward to the aid stations.

(3) Afterward, to remain at their respective aid stations and there act as contact or liaison agents for their unit, sending back to the unit commander all the useful information they can obtain.

*c. Establishing contact.* Contact is established in one of two different ways:

(1) *Collecting station to aid station.* The contact agents remain with the collecting unit until the site for the collecting station has been fixed. Then, while the station is being established, the contact agents are sent forward to locate the aid stations.

(2) *Aid station to collecting station.* The contact agents are sent to locate the aid stations before the establishment of the collecting station has been started. This may be done either by attaching a contact agent to each battalion medical section before it enters combat, so that the contact agent accompanies it into position, or by dispatching the contact agents forward after the battalion sections are in position but while the collecting unit is still in a position in readiness. When this method is employed contact agents must be informed of the general area in which the collecting station will be located. The choice of methods will depend upon the situation; elimination of delay is the guiding consideration.

*d. Instructions to contact agents.* When contact agents are not attached to battalion sections prior to combat, but are

dispatched forward by the collecting unit commander, their instructions must include the following:

- (1) Direction of the enemy.
- (2) Boundaries of the zone of responsibility of the collecting unit, shown both on the ground and on the map.
- (3) Designation of the unit, or units, to which the contact agent is being sent.
- (4) Location of such unit, or units, if known.
- (5) General route to be followed.
- (6) Any information to be transmitted to the regimental or battalion surgeon to whom the contact agent will report, such as the location of the collecting station and when litter squads may be expected to arrive at the aid station.

*e. Local distribution of contact agents.* When two or more contact agents are being dispatched to a combat regiment, all should report initially to the regimental surgeon so that he may distribute them according to the plans for the employment of the regiment.

*f. Failure of a contact agent to report.* If a contact agent sent to locate an aid station does not report back to the collecting station at the proper time, another contact agent or other soldier capable of performing the duty must be sent. Liaison must be established and maintained.

*g. Contact agents at aid stations.* Contact agents must not only be intelligent and highly trained but must exhibit initiative and have a keen sense of the importance of their duties and the responsibilities of their position if they are to be of any value to their commanding officer and to the medical service. They are there to obtain early and reliable information, and they must get it and transmit it. Their duties are to keep the collecting unit commander constantly informed of:

- (1) A change or contemplated change in the location of the aid station.
- (2) The prevailing type of wounds or gas casualties.
- (3) The number of wounded and whether increasing or decreasing.
- (4) The progress of the regiment or battalion to which attached.

(5) Enemy counterattacks of new infantry units engaged or about to engage as communicated to the contact agent by the regimental or battalion surgeon, and any other information pertinent to the military situation if it concerns the collecting unit.

*h. Agencies for transmitting information.* (1) The agencies available to contact agents for transmitting their information to the collecting station are usually limited to returning litter bearers, walking wounded (unreliable, but used when necessary), ambulances arriving at the aid station or a nearby loading post, and the telephone, when available.

(2) Messages of special importance are sent in duplicate by two different agents. One message is marked "Duplicate."

(3) Sketches are sent when they supplement a written message or better explain a certain situation than does a message.

(4) Each contact agent is provided with a field message book and pencils.

**357. Litter Bearers.** *a. Task.* The assembling of litter wounded at a collecting station is a slow operation. The time required to evacuate aid stations of their litter wounded is a function of three variables: the number of litter wounded, the number of litter bearers, and the time required to make the trip between the aid station and the collecting station. Distance is no accurate index of this time, since difficulties may alter the usual relationship between time and space.

*b. Factors tending to retard collection rate.* (1) Poorly trained or ill-disciplined litter bearers.

(2) Night collection. (See *g* below).

(3) Casualties scattered over field instead of being assembled at aid stations. (See *f*(1) below.)

(4) Inclement weather; difficult terrain, such as mud, rough undergrowth, etc.

(5) Enemy fire and gas.

(6) Enemy counterattacks.

(7) Long litter carriage.

(8) Fatigue of litter bearers. During hard fighting, fresh litter bearers can be expected to work the first 20 to 24 hours with but little rest. Thereafter they should be relieved and rested every 12 hours.

(9) Casualties sustained by litter bearers.

*c. Measures for increasing the rate of collection.* (1) *Use of wheeled litter carriers.* A wheeled litter carrier is a light collapsible, two-wheeled, rubber-tired, hand-propelled vehicle which will transport one patient on a litter. Each carrier is operated by two bearers. Each collecting unit is equipped with wheeled litter carriers. They should be allotted to bearer elements according to numbers of patients to be transported, distances to be traversed, and suitability of terrain. By establishing relay posts, carriers may be used for parts of the distance, substituting carriage by hand over stretches not suited to their use.

(2) *Forward displacement of the collecting station.* An aid station is not located for convenience to the collecting station. The location of the latter must conform to the movements of the former. While it is true that the movement of a completely established collecting station entails considerable effort and is to be avoided unless necessary, the reduction in capacity of litter bearers may outweigh the advantages of retaining a collecting station site. When this point is reached the station should be moved forward to decrease the distances that patients must be transported by bearers.

(3) *Use of advanced ambulance loading posts.* Advanced ambulance loading posts should be used whenever practicable and the situation permits. In some situations they may be used during the hours of darkness when their daytime use is impossible. An advanced ambulance loading post is established by the ambulance unit upon the request of the collecting unit. In the event that the ambulance unit commander disagrees as to the practicability of operating ambulances in advance of the collecting station, the decision is made by the

next higher echelon commander, normally the commander of the division medical unit.

(4) *Reinforcement with personnel from collecting unit in reserve.* If there be in reserve a collecting unit whose employment in the near future is not contemplated, individual personnel or subordinate elements may be detached therefrom to reinforce a collecting unit in action. The relative expediency of this course and that discussed in (5) below must be carefully considered. It may be advantageous to relieve an exhausted company with a fresh one, placing the former in reserve to recuperate.

(5) *Leapfrogging with another collecting unit.* This procedure consists in placing an unengaged unit in action to establish a new collecting station farther forward, closing the old station when the new is in operation. Though not always practicable, this procedure is most useful in certain situations. A typical situation in which its use is indicated is to be found in a successful attack by combat teams in column.

d. *Litter squads in extended order.* For a detailed discussion of extended order see FM 22-5. The bulk of the work of litter squads is not done in formation, but formations are necessary in the advance to aid stations and in clearing areas of wounded that have not been taken to aid stations. Such formations reduce casualties in litter squads, promote control, and insure a thorough search of the field. All distances and intervals shown in figure 120 are approximate and are intended only as guides.

(1) *Column of litter squads.* This formation facilitates control or change of direction and presents the smallest possible frontage to direct enemy fire. It is most frequently used in advancing to a definite objective, usually an aid station, over terrain subject to hostile observation and fire, or in following a concealed route, as a draw or ravine. A distance of 50 yards between litter squads in the column is usually adequate. The platoon sergeant marches at the head of the column. The section leaders march where they can best control their sections.

(2) *Line of litter squads.* This formation finds its greatest usefulness in searching and clearing the field of wounded after combat. At night, in close, rough, and wooded country, the interval between litter squads must be less than on open and flat terrain. The platoon sergeant marches well in advance of the center of the platoon so that he may be the first to arrive in new territory, make his decisions, and transmit his orders to his section leaders.

(3) *Line of section columns.* This formation is sometimes useful in crossing dangerous areas or in approaching woods in order to provide quick concealment and at the same time present an inconspicuous target. A distance of 50 yards between litter squads in the column is usually adequate.

e. *Advance to and clearing of aid stations.* (1) *Prior to advance.* Litter bearers are usually not dispatched until the locations of the aid stations are definitely known. While awaiting the return of the contact agents, the situation so far as known is carefully explained to the platoon sergeants and section leaders. As the exact locations of aid stations are

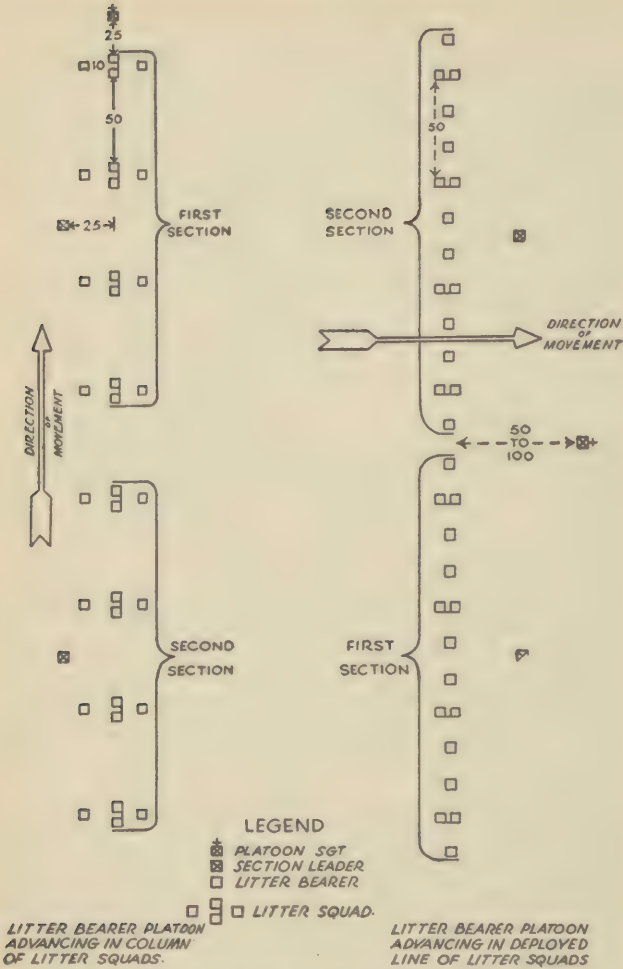


Figure 123. Extended Order Formations of Litter Bearers.

learned, they are plotted on maps or sketches. Apparent loss of time, occasioned by holding the bearer platoons at the collecting station until positive information of aid station positions is obtained, is fully repaid in diminished loss of personnel, fewer chances of going astray, and in a better organization of the bearer service. Although the platoon or section may be accompanied by the contact agent, the platoon sergeant or section leader must understand where he is going

and how he is going to get there before being permitted to start.

(2) *Advance.* Over favorable terrain, it is usually feasible to leave the collecting station personnel in column of litter squads closed up. This formation is retained as long as it is safe, but as dangerous areas are approached the distance between litter squads is increased as may be necessary in order to avoid unnecessary losses. Actively shelled areas are avoided whenever practicable. Advantage is taken of terrain features to secure cover from fire, and particularly concealment from hostile observation. If the litter carry is 1000 yards or more, a litter relay post is established at a selected point, and the necessary number of squads left to man it. (See *h* below.)

(3) *Evacuation.* When the aid station is reached, evacuation begins at once, all litter cases being carried back to a litter relay post, the collecting station, or an advanced ambulance loading post. With occasional rests, the litter bearers ply continuously back and forth between these points and the aid stations until all wounded have been evacuated, or until the bearers have been relieved. It is essential that aid stations be cleared as rapidly as possible, not only that the wounded may reach a place of definite treatment with the least practicable delay but, from a broader point of view, it is essential that the wounded be removed from the sight of the combatant troops. It occasionally happens that the wounded lying to the rear of the aid stations must be temporarily neglected in order that the steady flow of wounded from the aid stations be not interrupted.

*f. Clearing field of wounded.* (1) When, in addition to removing the wounded from aid stations, the bearer platoons must also search and clear certain areas, their task is greatly increased and collection is thereby retarded. If casualties be numerous, reinforcement may be necessary. Such a situation may arise when combat troops have advanced some distance, necessitating corresponding advance and successive reestablishment of aid stations. It may occur in hard fighting without advance of the aid stations, the medical detachments being unable to cope with their tasks. Or it may arise in an interval between attack and counterattack when the opportunity must be seized to remove all wounded.

(2) When the field is to be cleared by the bearer platoons, they are assigned zones of action. Boundaries are designated by conspicuous landmarks, such as buildings, roads, streams, fences, isolated trees, or woods. The platoon or section forms in a deployed line of litter squads, using such intervals as may be indicated by the nature of the terrain and systematically searching all the ground as it advances. The effectiveness of the search is increased in each squad by having the numbers 1 and 4 move 10 to 25 yards on each side of the litter. Upon finding a wounded man, he is removed to the central axis and the search is resumed where he was found. The central axis should be a well marked, easily distinguishable feature, such as a road or fence. This central axis is finally cleared to the collecting station by ambulance if practicable; otherwise by litter or wheeled litter carrier. It is

sometimes desirable to evacuate wounded as found to a litter relay post.

*g. Clearing field of wounded at night.* (1) This is frequently necessary, and in dark nights on strange terrain is attended by great difficulties, the most serious of which are:

(a) Loss of control of litter bearers.

(b) Inability to find all wounded, especially the most seriously wounded, or uncertainty whether all wounded have been found.

(c) Difficulty in resuming search where last patient was found.

(d) Difficulty in maintaining proper direction of search.

(2) Measures which facilitate night collection are as follows:

(a) If possible the clearing of the field should be initiated before it has become quite dark. If this cannot be done, a reconnaissance of the area to be searched by the officers and noncommissioned officers who are to direct the work of the bearers is advisable even though hasty. Prominent and easily recognized and followed landmarks are to be noted in this reconnaissance.

(b) Disciplined bearer units thoroughly trained in night exercises, and the use of the luminous compass.

(c) Detailed organization of the bearer service, and a carefully worked out plan for the assigned task.

(d) Avoidance of dispersion of bearers until area to be cleared has been reached.

(e) Assignment of limited zones of action to subunits marked by easily recognized boundaries, such as roads, buildings, fences, streams, railroads, edges of woods.

(f) Material reduction of intervals depending on the character of the terrain and the degree of darkness.

(g) Reduction of distances with reference to litter relay posts, central axes to which patients are carried, and advanced ambulance loading posts.

(h) Close contact and control by section sergeants including periodical reporting of bearers at local command posts.

(i) A white band (wide bandage) around each bearer.

(j) One member of each squad to remain at the point where the last patient was found to mark the place.

(k) Assignment of guides to bearer platoons brought up from the rear after dark.

(3) The evacuation of aid stations at night is less difficult after the stations have been located. The best evacuation routes to the collecting station are selected. Frequently, desirable routes can be taken at night, the use of which in the daytime is impossible. Distances between litter relay posts may be somewhat reduced.

(4) If the military situation permits of lights being used, the problem of night evacuation of wounded is simplified.

*h. Litter relay posts.* (1) Litter relay posts are established as required, usually about every 600 yards. Over good terrain the distance between relay posts can be increased several hundred yards. The relay posts are on the litter bearer routes which extend from the aid station back to the collecting sta-

tion or any other point at which wheeled litter carriers, light railway, or ambulances can take over the patient. It is uneconomical and unnecessary to locate wheeled litter-carrier relay posts as close together as are litter relay posts. In favorable situations, it may be practicable to cover the entire distance between an aid station and the collecting station with wheeled litter carriers. In other instances their use will be more restricted, forming only a link in one or more evacuation routes.

(2) *Points selected.* So far as practicable, litter relay posts are so spaced that all bearers in the chain of evacuation are kept approximately equally occupied. The relay posts should be definitely organized, affording shelter during inclement weather, some security from hostile fire, a small reserve of blankets, litters and splints, and a place for storing food. Frequently shell holes, dugouts, or trenches can be used.

(3) *Personnel.* The strength of a relay post will vary. Occasionally as many as 24 bearers are assigned.

(4) *Operation.* The operation is simple. Posts are numbered from front to rear. A bearer squad with patient arrives from an aid station at post No. 1; turns its patient over to a bearer squad at post No. 1 without removing him from the litter; takes a litter from the stack and returns at once to the aid station. In the meantime, a bearer squad from post No. 1 carries the patient to relay post No. 2 or to the collecting station as the case may be. The organization of the relay post system varies according to the situation. One line of relay posts may be established to each aid station being evacuated, all converging at the collecting station; or, as is more frequently the case, especially if the front be not wide, the chain may run forward to No. 1 post which is centrally located in the rear of and close to the aid stations, and all wounded are evacuated from the aid stations to No. 1 relay post, and thence back through the relay route. Each situation must be studied with a view to the simplest, most rapid and economical removal of litter patients from the aid stations to the collecting station.

i. *Officer commanding litter-bearer platoons.* An officer under the company commander is responsible for organizing and operating the litter bearer service during combat. When necessary, he leads the bearer platoons forward and makes the initial dispositions. He establishes his command post normally at the collecting station or at a litter relay post from which he can best control and coordinate collection in the company zone of action. He goes, however, wherever his services may be required. He informs the platoon sergeants of his position and keeps in communication with them. He keeps the company commander constantly informed of the situation and makes timely requests for reinforcements or relief of his bearer platoons.

j. *Platoon sergeant.* The platoon sergeant receives his orders during combat from the officer commanding the litter bearers. He goes forward with his sections and personally sees that they reach the aid station or stations, or other objective, and gets evacuation under way at once. He organizes litter relay posts as directed and supervises the work of his

platoon. He takes post at a point from which he can best control the functioning of his platoon. This may be at a relay post or a point where the evacuation routes of his two sections converge. He maintains close contact with the section leaders at all times and keeps his commanding officer constantly informed of the situation in his platoon and zone of action.

*k. Collection of artillery casualties.* Collecting units rarely establish contact with the aid stations of artillery units for the following reasons: casualties among artillery personnel are normally less than in infantry units, and the attached medical personnel of artillery units are able to prepare their casualties for evacuation to the clearing station; ambulances ordinarily can reach artillery aid stations with safety; and the medical detachments of almost every artillery unit are equipped organically with ambulances. Consequently, artillery casualties normally are evacuated directly from aid stations, either upon request to the division ambulance unit operating in the area or by the organic ambulances of their own medical detachments.

**358. Closing Collecting Stations.** The procedure of closing the collecting station is practically the reverse of its establishment, except that in closing the station the bearer platoons do not participate.

*a. All patients are evacuated.*

*b. The personnel of each department packs its own equipment.*

*c. The truck drivers bring their trucks to the designated loading positions.*

*d. The collecting station personnel strike and fold the tents.*

*e. The collecting station personnel load the station's equipment trucks.*

*f. Directed by the mess sergeant, the cooks and their helpers load the kitchen supplies.*

*g. The loaded trucks take their march position.*

*h. The unit forms in skirmish line and polices the area it has occupied. Upon the completion of this duty the unit falls in (with bearer platoons if they are to move with the company) and, if shelter tents were pitched, strikes them, slings equipment, and forms for route march.*

*i. Latrines are closed and marked by the truck drivers.*

*j. The commanding officer makes a personal inspection of the area.*

**359. Forward Displacement of Collecting Station.** *a. When warranted by the tactical situation, the forward displacement of a collecting unit at station by bringing the station closer to the majority of wounded and shortening litter carriage is an effective means of facilitating casualty collection. The collecting unit must keep close, effective contact with the front line troops in its zone of action or sector, the station being located close enough to the line of aid stations to make litter carriage as short as possible but not so exposed that the work of the station cannot be carried on. It must be recognized that litter bearers may properly be exposed to enemy fire to a greater extent than is practicable for the sta-*

tion itself. When in the opinion of the unit commander the station should be advanced, he makes the recommendation to the proper authority. The station is advanced only on orders of competent authority.

b. Forward displacement is indicated:

(1) During a successful attack, when the litter carry has become unduly long.

(2) When the enemy has abandoned the field, and the number of casualties and their distribution warrant a re-establishment of the collecting station.

c. Forward displacement is not indicated:

(1) When the advance is only a temporary fluctuation in the course of the battle.

(2) When the station in a more advanced position would be rendered useless by the enemy fire.

d. Important obstacles in effecting forward displacements are:

(1) Enemy artillery fire.

(2) Destroyed or impassable roads.

(3) Congested roads or roads reserved for the advance or relief of combatant troops.

(4) Darkness.

e. Procedure. (1) The collecting unit commander, accompanied if possible by the ambulance unit commander concerned, makes a reconnaissance of the route or routes forward and of the vicinity in which the collecting station is to be reopened.

(2) The officer directing the litter bearer service is informed of the new location for the station and the hour at which the movement of patients thereto is to start. He re-groups his bearer service to meet the new situation.

(3) Medical supplies are replenished as necessary.

(4) Aid stations are notified by field messages of the location of the new station and when it will open.

(5) The station is cleared of any accumulation of wounded.

(6) Equipment and supplies are packed and loaded.

(7) The advance to the new site is made at the hour and by the route prescribed in the order from the battalion.

(8) The proper authority is informed as soon as the new station is opened.

(9) Ordinarily one truck and the equipment and personnel of the walking wounded department should remain at the old site until everyone concerned has been notified of the movement forward and the establishment of the new station.

**360. Dividing Collecting Unit for Tactical Employment.** a. The collecting station equipment is so made up and carried that the company can be divided into two approximately equal parts, each one of which is able to function on a limited scale as a collecting unit in combat.

b. Occasions which may make such a division of the company desirable or necessary are:

(1) When a force on a detached mission does not require a complete collecting company, or for which a complete company cannot be spared.

(2) When a force is fighting on an extended front against

a weak enemy, in a delaying action, or is holding defensively a wide front.

(3) When one or more terrain features divides the zone of action into two areas more or less inaccessible to each other.

(4) When only part of a collecting company is required for an advance, flank, or rear guard.

c. The company is so divided that each half contains its proportionate share of officers, equipment, and the functioning subunits of the company.

**361. Relief of Collecting Unit at Station.** a. When a collecting unit at station is to be relieved, orders are issued designating the organization for the relief, the date and hour the relief is to be completed, route by which the relieving unit will approach the station, and the elements of the old unit to remain in the area for the guidance of the new. Guides are detailed to meet the new unit. This is especially necessary in night reliefs.

b. Upon receipt of the order, the commander of the relieving unit or an officer designated by him proceeds to the unit he is to relieve for arrangement of details and a thorough reconnaissance of the entire area covered by the unit he is relieving. He takes over all maps of the sector and all property which is to be exchanged. He familiarizes himself with all sector orders. He must note especially the following important points:

(1) Location of all aid stations and the routes thereto.

(2) Location of each relay post and advanced ambulance loading posts (if any).

(3) Wheeled litter-carrier routes.

(4) Location of the ambulance station.

(5) Source of water supply and purity of the water.

(6) Source of fuel.

(7) Characteristics of enemy fire and his habits relative to the use of gas.

(8) Areas which come under enemy observation.

c. The relief of the litter bearers conforms to the methods governing such operations. No relief should be carried out without leaving important elements of each section being relieved in position to aid the incoming litter bearers during the first few hours. The men so left are used in giving information of the area and in guiding groups from place to place until the new personnel are thoroughly familiar with the terrain and the peculiarities of the enemy artillery on this portion of the front.

## SECTION III

### DIVISION AMBULANCES

**362. Functions.** *a. General.* The ambulances of the division medical unit furnish the transportation, described below, within the division area. They are not employed normally to evacuate casualties from the division; this is a function of ambulance units of higher echelons. Nor must the ambulances of the division medical unit be confused with those assigned to the medical detachments of certain other elements of the division, notably artillery.

*b. In other than combat situations.* The transportation of evacuees from dispensaries to the agency designated to receive the patients of the division.

*c. In combat.* (1) *Primary.* (a) The transportation of evacuees from collecting stations (and occasionally certain aid stations) to the clearing station.

(b) The transportation of litter wounded from advanced ambulance loading posts to collecting stations.

(c) Emergency care and treatment of sick and injured *en route*.

(2) *Secondary.* (a) The transmission of messages from one medical unit to another along the assigned routes of evacuation.

(b) The transportation of medical supplies from the division medical dump to units farther forward.

(c) The transportation of medical personnel, particularly of collecting units, to and from battle stations.

**363. Control.** *a. General.* In one type of division medical unit, ambulances are controlled by ambulance unit commanders. In the other type, they are controlled by collecting unit commanders. In either case each major ambulance element is commanded by an officer of the Medical Corps, and the general principles of control and operation are the same.

*b. Orders to ambulance elements* may specify the exact route or routes to be used, or they may list certain available routes and leave the final selection to the discretion of the ambulance commander. In either event the ambulance commander must be informed of all traffic restrictions that may affect his operations.

*c. Reconnaissance.* Whenever practicable, ambulance commanders should reconnoiter all routes available or likely to become available within their zones of operation. Such reconnaissance is not alone for the purpose of selecting or familiarizing themselves with initial routes, but also for securing information of alternate routes in the event that changes in the situation may indicate or require the abandonment of the initial route.

*d. The ambulance plan* should include:

(1) The initial ambulance route and possible alternate routes.

(2) Locations of the ambulance station, of relay posts, of traffic posts, and of advanced ambulance loading posts.

(3) Distribution of ambulances among tasks and among the several posts.

(4) Provisions for supply and maintenance of vehicles.

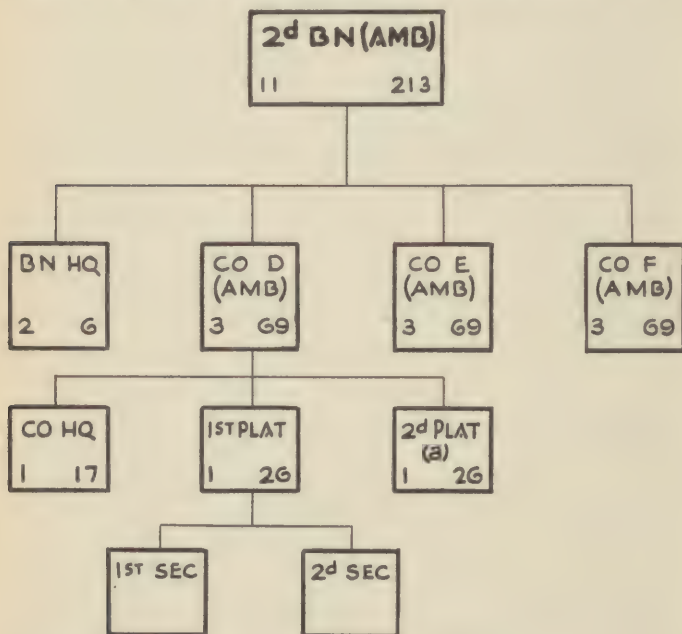
(5) Provisions for relief and messing of personnel.

**364. Ambulance Routes.** The following considerations govern the selection of ambulance routes:

a. Availability.

b. Physical characteristics, such as the surface, width, and grades of roads, and the practicability of cross-country routes.

c. Other traffic on same routes or portions thereof.



Note: 20 Amb, field, cross country, per company.

(a) Same as 1st plat.

Figure 124. Functional Organization of the 2d Battalion (Ambulance), Medical Regiment. T/O 8-35, Nov. 1, 1940.

d. Relative length, compared with other possible routes.

e. Proximity to terrain features or installations that may draw enemy fire, or including intersections likely to be interdicted.

f. General protection from enemy observation and fire.

g. Cover for concealment of movement or for ambulances at rest.

**365. Ambulance Station.** a. *Definition.* The ambulance station is the combat installation of an ambulance unit for the control of its service. It invariably includes the unit CP, and usually includes the basic relay post and the house-keeping and motor maintenance facilities of the unit.

b. *Location.* The ambulance station must be on or im-

mediately adjacent to the route used by the unit in question. It should be beyond the range of hostile small-arms fire, and be protected from light artillery fire. Concealment is desirable, with cover and hard standings for transport. To facilitate control, a location between 1 and 2 miles in rear of the collecting station is optimum.

c. *Establishment.* The two initial requirements of an ambulance unit beginning or changing the locale of its operations are the establishment of the ambulance station and of the ambulance shuttle. These are done simultaneously, supervised by the unit commander and his second-in-command. Locations are designated for the CP, message center, kitchen, latrines, motor park(s), and bivouac.

d. *Message center.* The message center is established at the side of the route used by ambulances so that messages may be examined without causing ambulances to leave the route. It is operated by the message center clerk, and its functions are:

(1) To receive, dispatch, and record all messages to and from the unit.

(2) To act as a clearing house for all messages and supplies carried by the ambulances of the unit for other units. The destination of such messages and supplies is checked at the message center. If the ambulance upon which they arrive is not proceeding directly to the indicated destination, messages or supplies are transferred to the proper ambulance. This is the rule in the case of messages and supplies *en route* from rear to front, since ambulances returning from the clearing station normally stop at the basic relay station.

(3) To stop and examine each ambulance *en route* to and from the clearing station, entering the following data in the unit "log" in each case:

(a) Serial number of the ambulance.

(b) Name of the driver.

(c) Hour of arrival and departure of the ambulance.

(d) If the ambulance be carrying patients, the number each of litter and sitting patients.

This log serves two purposes: it is a current record of the distribution of the ambulances of the unit; and it is a check on the numbers of casualties evacuated to the clearing station. (See FM 8-45.)

e. *Messing.* When practicable, all personnel are messed from the ambulance station. The company may be divided into reliefs for messing, or lunches may be distributed. Personnel to the front of the collecting station or at the clearing station are fed from those stations.

f. *Closing station.* The ambulances are withdrawn from the shuttle and formed in column. The station is dismantled; cargo vehicles are loaded and take their places in the column. The personnel are assembled, tents struck, packs rolled, latrines filled and marked, and the site policed and inspected.

**366. Ambulance Shuttles.** a. *Definitions.* (1) The *ambulance shuttle* is a method of operating ambulance service in combat. It consists of one or more ambulance loading posts, one or more ambulance relay posts, and such ambulance traffic posts as may be required. Its purposes are to

keep an empty ambulance at each loading post at all times, to prevent congestion of ambulances at any one place, and to facilitate the control of ambulance traffic. The dispersion of ambulances in a shuttle reduces losses from any single missile, and prevents traffic tie-ups in places where maneuver room is restricted.

(2) An *ambulance loading post* is a point in the shuttle, normally the point farthest forward, where one or more ambulances are stationed ready to receive patients for transportation. Ambulance loading posts are established by ambulance units, but the loading of patients is normally done by collecting personnel.

(3) An *ambulance relay post* is a point in the shuttle where one or more empty ambulances are stationed, ready to advance to replace an ambulance which has left the next post toward the front, whether it be another relay post or a loading post. Relay posts are numbered from front to rear. The *basic relay post* is that one farthest to the rear where the bulk of the unemployed ambulances, or such as remain after all other relay posts have been provided for, are stationed. It is located normally at the ambulance station.

(4) An *ambulance traffic post* is a point at a crossroad or road junction where an ambulance route divides into two or more routes to different loading posts. It is operated by a noncommissioned officer or private of the ambulance unit. This soldier, knowing which route each loaded ambulance has followed, directs its forward-moving replacement to that route. This maintains the proper number of ambulances in each division of the shuttle.

(5) An *advanced ambulance shuttle* is one operated between a collecting station and one or more loading posts farther forward. Its purpose is to relieve litter squads of the collecting unit of all or part of their task. The collecting unit commander requests its establishment; but the decision to establish it rests with the ambulance unit commander or, in case of appeal by the collecting unit commander, with the authority controlling both elements.

*b. Establishing ambulance shuttle.* (1) *General.* The establishment of an ambulance shuttle may begin at either end. When the ambulance unit transports the collecting unit via the ambulance route to the site of the collecting station, the responsible officer makes a reconnaissance on the journey forward, selects the locations of relay posts, and drops from the convoy on its return journey the proper number of empty ambulances at each post selected. If the convoy does not travel the entire ambulance route prior to the establishment of the ambulance station, the responsible officer reconnoiters the remainder, returns, and leads forward the proper number of ambulances to establish each relay and loading post selected.

(2) *Location of relay post.* The following features are desirable in the location of a relay post:

(a) Hard standing which does not interfere with the passage of ambulances or other traffic en route.

(b) Concealment of ambulances at the post from ground and aerial observation.

(c) Unobstructed view of the ambulance route, and recognizable to ambulances en route.

(d) Protection from direct fire.

(e) Ample distance from terrain features or other installations that may invite hostile fire or air action.

(3) *Distances between relay posts.* The number of relay posts and the distances between them will vary with the situation. The primary purpose of the shuttle being to keep an empty ambulance at each loading post at all times, the first relay post should be near enough the loading post to permit a loaded ambulance to be replaced without delay. Distances between succeeding relay posts will depend upon suitable locations, the total length of the shuttle, the rate at which ambulances are loaded, and the number of ambulances that it is desirable to keep forward of the basic relay post. In general, relay posts should rarely be located nearer each other than 500 yards, nor farther apart than 1500 yards.

(4) *Number of ambulances at each relay post.* The maximum number of ambulances allocated to a relay post depends upon the situation. There are disadvantages in allocating a single ambulance to a relay post. The post either must be plainly marked or a soldier-in-charge must be stationed there, else drivers may pass it inadvertently; it permits of no transfer of messages or supplies to ambulances that will arrive at the loading post sooner; and one missile may destroy the entire post. These disadvantages are largely obviated by allocating two ambulances to each relay post. More than two is rarely indicated, except at the basic relay post. Whenever more than one ambulance is stationed at a relay post, including the basic relay post, they must be dispersed sufficiently to prevent more than one ambulance being put out of action by a single missile.

(5) *Operation of shuttle.* (a) *General.* An ambulance is loaded at a loading post and starts to the rear. As it passes the first relay post the forward ambulance in that post moves at once to the loading post; the second ambulance in the first relay post moves to replace the first in the forward position in the post, and this shift continues until all ambulances in the post have moved forward one position. As the loaded ambulance on its way to the rear passes the second relay post, the forward ambulance in that post moves forward and occupies the rear position in the first relay post, and the other ambulances in the second relay post shift their positions one place forward as described above. This same operation is repeated as the loaded ambulance passes each relay post, including the basic relay post, on its journey to the rear. When the loaded ambulance has discharged its patients, usually at the clearing station, it returns to the basic relay post and takes station.

(b) *Control.* A noncommissioned officer or other qualified soldier should be placed in direct charge of the basic relay post, since the number of ambulances stationed there and the necessity for dispersion may make control of this post difficult. If personnel can be spared, there are advantages in placing a soldier in charge of each relay post; the transfer of messages and supplies is thereby facilitated,

and control is improved generally. However, if more than one ambulance is allocated to each relay post, an additional soldier in charge is not absolutely essential. Well trained drivers are able to operate without other supervision.

(c) *Forwarding messages and supplies.* For the delivery of messages on the way to the rear see paragraph 365d. Messages and supplies on the way to the front are expedited by the following procedure: The message center removes such messages and supplies from ambulances reporting to the basic relay post and places them on the first ambulance proceeding toward the front. As the latter ambulance reaches the next relay post, such messages and supplies are transferred to the ambulance occupying the forward position in the post, and are similarly transferred to the leading ambulance in each relay post. The soldier in charge of an ambulance traffic post examines all messages and determines the destination of all supplies passing his post en route to the front. If necessary, he retains them in his possession until an ambulance passes his post destined for the proper loading post. Ambulances are not diverted from their proper routes to make such deliveries. Urgent messages and supplies urgently needed are not forwarded through the shuttle.

**367. Operations.** a. *General responsibilities of unit commander.* An ambulance unit commander is responsible for all phases of the activities of his unit. The more important of these responsibilities are:

(1) Establishment, supervision, control and termination of the ambulance service furnished by his unit.

(2) Provision of shelter, facilities for messing, and opportunities for resting to the personnel of his unit.

(3) Maintenance of the transport of his unit, including its protection from enemy action.

(4) Supervision of the operations of his unit as an agency of communications and of delivery of supplies.

(5) Emergency treatment of patients committed to the care of his unit.

(6) Transmission of timely information to his immediate superior concerning the situation within his unit.

b. *Absences of the unit commander.* Proper performance of his many duties will require the unit commander to be absent from his CP much of the time. Before so absenting himself, he must notify the message center of his probable whereabouts.

c. *Allotment of tasks.* Whenever the mission of the unit comprises two or more component tasks, or whenever only a portion of the means of the unit are required for the unit task, tasks should be allotted to prescribed subordinate elements of the unit, such as platoons or sections, rather than to detachments improvised from ambulances of two or more elements.

d. *Plans and orders.* The dependency of ambulances upon routes and the possibility of denial at any time of their use by the enemy require an ambulance unit commander to have, at all times, at least one alternate plan that can be placed in operation without delay. He must have a working knowledge of all available routes in his zone of action, and plans

for their adaption to his requirements, subject to any restrictions imposed by higher commanders. His plans must include provision for the movement, in either direction, of the termini of his ambulance routes. The orders of an ambulance unit commander usually are issued orally, or in the form of written messages, to his subordinates.

*e. Liaison.* Since the ambulance unit normally is the connecting link between the functions of collecting and clearing, close liaison with the two units charged with those functions is necessary.

(1) *With collecting unit.* A junior officer or a noncommissioned officer of the ambulance unit is stationed at the collecting station. His principal duties are:

(a) To supervise the operation of the forward end of the ambulance shuttle. It must be remembered, however, that the loading of ambulances including the determination of numbers to be carried in each load is a responsibility of the collecting unit.

(b) To keep the ambulance unit commander informed of the situation at the collecting station.

(c) To supervise the property exchange.

(d) To transmit to the proper agency in the collecting unit messages and supplies brought forward by ambulances.

(2) *With clearing unit.* A noncommissioned officer of the ambulance unit is stationed at the clearing station. His principal duties are:

(a) To exercise general supervision of ambulances during their stay at the clearing station. The unloading of ambulances at this point is a responsibility of the clearing unit.

(b) To supervise the property exchange.

(c) To deliver to returning ambulances such messages and supplies as they are to carry to the front.

(d) To inform the ambulance unit commander of any changes in the clearing plan.

*f. Emergency treatment of patients en route.* All drivers and assistant drivers are trained in first aid and carry the individual equipment of the medical soldier. It is their duty to render such first aid to patients en route as may be required. In addition, when a loaded ambulance is checked at the message center, a medical officer, when practicable, or a noncommissioned officer should inspect the patients to ascertain any need for emergency treatment. Such technical measures are necessarily of limited scope; but an ambulance unit is responsible for rendering such emergency treatment as is possible with the means at hand.

*g. Protection of ambulances and patients.* Ambulances are no more sacred than other military means; nor are the lives of patients more precious than those of effectives. When necessary to the accomplishment of the mission, both must be exposed to danger. However, all practicable measures must be employed at all times to minimize the danger of destruction of ambulances and the further injury of patients. The more important of these measures are:

(1) *Concealment.* Movements may be made at night without lights when daytime movement is impossible.

(2) *Defilade.* Full use should be made at rest and in movement of any protection offered by the terrain.

(3) *Dispersion.* In convoy and at rest, when exposed to the danger of hostile fire or air action, the distances between ambulances should be increased to the point where serious damage is possible to no more than one vehicle from any one missile.

(4) *Mobility.* Speed, up to the practical limit of safety, should be employed in crossing exposed stretches. Beyond a reasonable limit, it may prove more dangerous than the enemy.

*h. Transportation of collecting unit personnel.* When the personnel of a collecting unit are transported by an ambulance unit, the movement is under the control of the ambulance unit commander unless his unit is a part of the collecting unit. If such details of the movements are not prescribed by higher authority, he determines the route, speed, arrangement of the convoy, and the point at which the movement must be stopped in the interest of the safety of his vehicles. The trucks of the collecting unit follow at the rear of the vehicles of the ambulance unit.

*i. Directing signs.* Whenever practicable, directing signs suitably marked with the unit designation should be posted at all points along an ambulance route where drivers may become confused. Other suitable signs marking the ambulance station, message center, motor park, and relay, traffic, and loading posts may be used.

*j. Road and bridge repair.* While maintenance of ambulance routes is not a primary responsibility of an ambulance unit, in emergencies ambulance personnel must make temporary repairs to roads and bridges to prevent interruption of the service. Ambulance units are equipped with simple tools for this purpose.

**368. Maintenance of Transport.** The ambulance unit being primarily a transportation agency, the maintenance of transport is a principal concern of the unit commander. For further details concerning the maintenance of animal transport, see FM 25-5; and concerning the maintenance of motor transport, see FM 25-10. Of the several echelons of motor transport maintenance, the unit commander is concerned with the first two. These are:

*a. First echelon maintenance.* First echelon maintenance is the "vehicle operator's maintenance," and embraces cleaning, lubricating, servicing, and minor repairs. It is that daily attention necessary to keep a vehicle in proper mechanical condition and acceptable in appearance. Minor repairs include the tightening of loose bolts, nuts, and screws, and such emergency roadside repairs as can be made by the driver with the tool kit and the spare parts usually carried in the vehicle.

*b. Second echelon maintenance.* Responsibility for second echelon maintenance functions is divided between the ambulance unit commander and the motor maintenance group of the headquarters or headquarters and service company of the division medical unit. Insofar as second echelon maintenance is concerned, the ambulance unit commander's responsibility is primarily that of prevention and inspection.

## SECTION IV

### CLEARING

**369. Definitions.** *a. Clearing* is the process of disposing of the casualties of a division or comparable unit. It consists of sorting all casualties of the unit, returning to duty such as are immediately fit for full duty, and transferring all others, except the dead, to a medical unit of a higher echelon. It is not to be confused with hospitalization.

*b. A clearing station* is an installation established by a clearing unit for the purpose of discharging the function of clearing.

**370. Clearing Units.** *a. Functions.* (1) *General.* A clearing unit is necessary to supplement the service rendered by other echelons of the medical service of the division. Collecting stations must not be located too near the front to permit their being equipped for the thorough treatment of shock or for the preparation of patients for extended evacuation. Nor can there be operated at collecting stations the clerical force necessary in the preparation of reports and returns required by the commander, and of the individual records of patients.

(2) *Combat functions.* A clearing unit is primarily a combat organization. Its principal function is to establish and operate in combat one or more clearing stations at which casualties are received, sorted, given temporary care and emergency treatment and, when indicated, prepared for further evacuation and transferred at the clearing station to a medical unit of a higher echelon, usually an ambulance unit of the army medical service.

(3) *In other than combat situations.* If a clearing unit be organized and equipped for the purpose, it may undertake limited care and treatment of such sick and injured as will be fit for full duty within a short time. The discharge of this function, however, requires suitable organization and equipment.

*b. Functional organization.* (1) *General.* The organization of clearing units varies with the type of division medical unit of which they are parts. However, all clearing units are organized functionally into a unit headquarters, a technical group, and a transportation group.

(2) *Unit headquarters* comprises such commissioned and enlisted personnel as are required for the command and administration of the unit. The size of this group and the scope of its functions depend upon whether the clearing unit is an autonomous company or a subordinate platoon of a headquarters company.

(3) *The technical group* comprises the commissioned and enlisted personnel who operate the clearing station.

(4) *The transportation group* comprises the personnel required for the operation and maintenance of the transport.

*c. Supply.* In clearing companies, supply is a responsibility of the clearing company commander; in clearing platoons, of the headquarters company commander.

**371. Clearing Unit Commander.** *a. General.* The senior officer of the Medical Corps present for duty with a clearing unit commands it. The scope both of his authority and his responsibilities depends upon whether the unit is a clearing company or the clearing platoon of a headquarters company.

*b. Duties and responsibilities.* (1) In a clearing company the administration, discipline, morale, and training of the

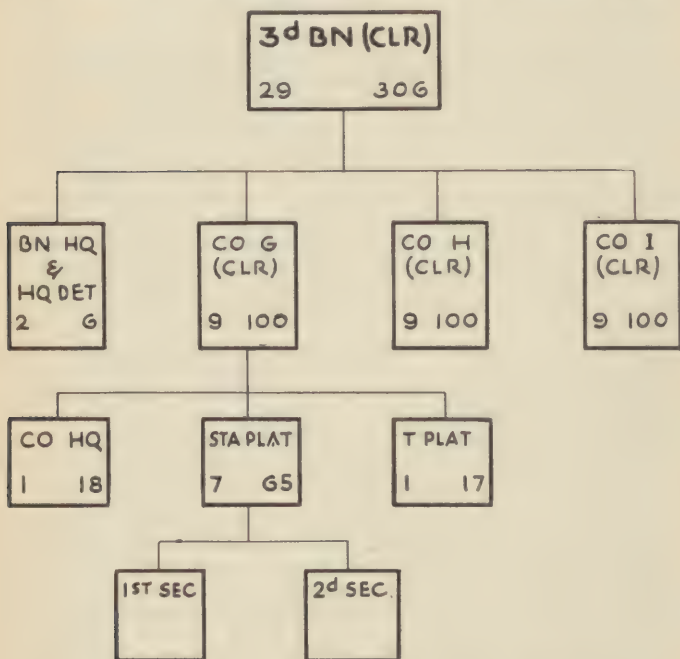


Figure 125. Functional Organization of the 3d Battalion (Clearing), Medical Regiment. T/O 8-45, Nov. 1, 1940.

company. In a clearing platoon these are responsibilities of the headquarters company commander; and, insofar as they pertain to the clearing platoon, the platoon commander assists.

(2) *In combat.* (a) Unlike the commanders of other subordinate elements of the division medical service, the duties and responsibilities of the clearing unit commander are restricted largely to the establishment and operation of the clearing station.

(b) Keeping higher authority informed of the situation at the clearing station.

(c) While the arrangement for evacuation of a clearing station is a responsibility of the division commander, the

clearing unit commander should keep the agency charged with the evacuation of his station fully informed of the situation with regards to numbers and classes of transportables awaiting evacuation, and of any anticipated changes in the situation. Cooperation in this respect will facilitate the movement of evacuees.

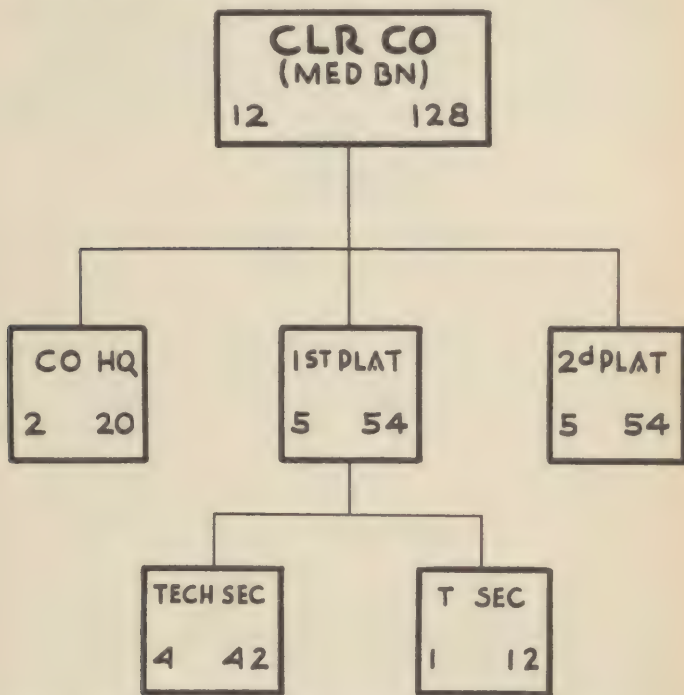


Figure 126. Functional Organization of the Clearing Company, Medical Battalion, Infantry Division, Triangular.

T/O 8-68, Oct. 1, 1940.

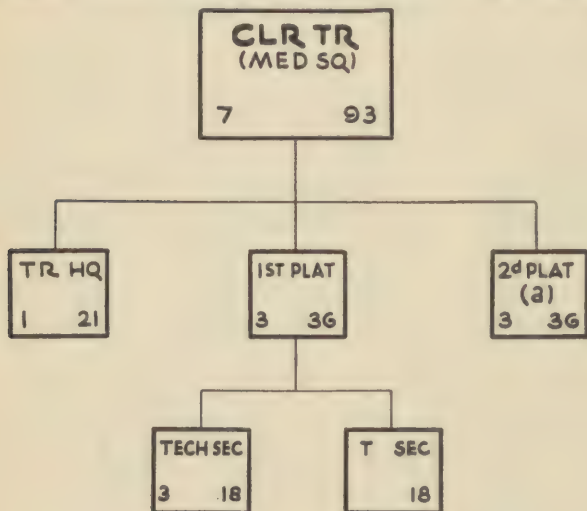
c. *Relations with other units.* The only direct contacts of a clearing unit are normally with division ambulance units to the front and with ambulance units of higher echelons to the rear. In each case the responsibility for liaison rests with the ambulance units whose dispositions and movements must conform to those of the clearing station.

**372. Establishing Clearing Station.** a. *When established.* To prevent immobilization of the division medical service, there must be a clearing station ready to receive patients as soon as any collecting station is ready to evacuate patients. In the usual situation this will be within  $\frac{1}{2}$  to 1 hour after collection begins.

*b. Selection of sites.* (1) *Responsibility.* The number of clearing stations to be established and their general locations are elements of the division medical plan. Unless prescribed in detail in the field order of the division medical unit, the selection of the exact site is a responsibility of the clearing unit commander.

(2) *Essential features.* (a) A location on or readily accessible to routes of evacuation both from collecting stations and to the supporting medical unit of a higher echelon.

(b) Space enough for a complete clearing station. A complete station is one of sufficient capacity, either organic or through reinforcement, to clear all casualties that may pass



(a) Same as 1st plat.

**Figure 127. Functional Organization of the Clearing Troop, Medical Squadron, Cavalry Division. T/O 8-88, Nov. 1, 1940.**

through it. In the selection of a site, the possibility of expanding the initial station must always be considered.

(c) Adequate supply of water. If a practicable means of transporting water is available, the source of the water need not be at the immediate location of the station.

(3) *Desirable features.* (a) Beyond the effective range of hostile light artillery.

(b) Protection from medium and heavy artillery, rarely completely attainable.

(c) Cover for concealment. Concealment of a clearing station is not alone for the purpose of safety. The location of a clearing station affords the enemy a reliable index to other dispositions of the division.

(d) Suitable buildings to substitute for or supplement tentage.

(e) Centrally located with reference to the lateral boundaries of the units which the station is supporting.

(f) Local fuel supply.

(g) Ample hard standings for ambulances and for the unit transport.

(h) A road loop to facilitate ambulance traffic.

(i) Good drainage and, when tentage must be used, soil suitable for the erection of canvas.

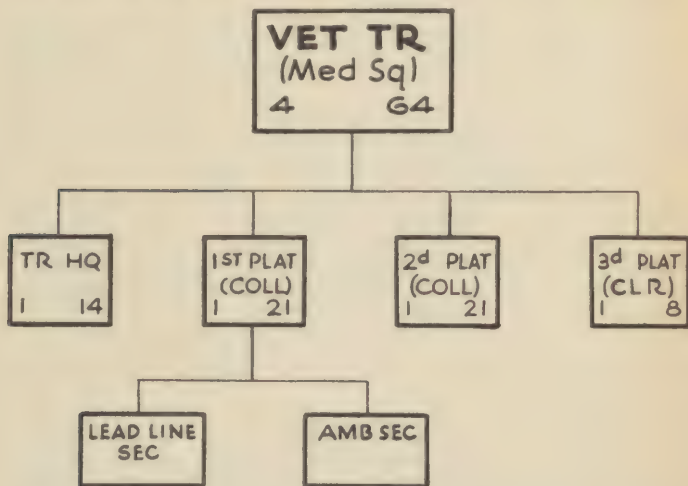


Figure 128. Functional Organization of the Veterinary Troop, Medical Squadron, Cavalry Division. T/O 8-89, Nov. 1, 1940.

(4) *Undesirable features.* (a) In general, the opposite of the features listed as desirable.

(b) Areas that favor the persistence of chemical agents. In general, these are low places and heavily wooded areas. This feature must be carefully weighed against the advantages of concealment and protection from artillery fire.

(c) Proximity to terrain features or other installations that may invite hostile fire or air action.

(5) *Average location.* The average location of a clearing station may be said to be one between 4 and 7 miles in rear of the division front line which combines as many desirable and as few undesirable features as possible with all essential features.

c. *Organization.* (1) *General.* The physical arrangement of a clearing station will vary with the characteristics of the site but the functional organization is rather definitely fixed by the requirements of the operation of clearing. The oper-

ation of the station falls naturally into the following departments:

(a) *Administration.* This includes the administration of the unit and of patients.

(b) *Admission.* To receive, record, sort, and direct patients to the proper department of the station for care and treatment.

(c) *Litter wounded.* In general, litter wounded are more serious cases than walking wounded, and their care and treatment require more elaborate equipment and more highly trained personnel. It is advantageous to create a separate department for them.

(d) *Shock cases.* The special equipment and specially trained personnel required for the treatment of traumatic shock make it essential that a department be set aside for this purpose.

(e) *Gas cases.* If chemical agents are employed by the enemy, a department specially equipped and manned for the purpose must be set aside for the care of such cases.

(f) *Walking wounded.* See (c) above.

(g) *Pharmacy and laboratory.* For the preparation of medicines and laboratory procedures.

(h) *Evacuation.* After a case has been dismissed by any of the technical departments, he is ready for evacuation. Such cases must be cared for until they can be evacuated, and records of evacuation maintained.

(2) *Use of buildings.* The use in whole or in part of existing buildings will modify the physical arrangement of a clearing station but should not affect its functional organization.

(3) *Exclusive use of tentage.* The arrangement of the tents will be determined by the terrain and other considerations, such as the necessity for concealment. If sufficient space is available and there are no reasons to the contrary, tents may be arranged as shown in figure 129. The *basic unit* consists of eight tents and the kitchen, which provide shelter for all departments but little space for patients awaiting evacuation. Reserve tents are erected as needed to provide additional space for patients.

d. *Setting up the station.* (1) *Unloading equipment.* The equipment of a clearing unit is loaded with a view to facilitating the establishment of the station. Unit loads are arranged

#### LEGEND, FIGURE 129

Tent No. 1. CP, clearing section, dental department, laboratory, and pharmacy.

Tent No. 2. Admission and sorting.

Tent No. 3. Supply section, property exchange.

Tent No. 5. For patients awaiting treatment.

Tent No. 6. For shock treatment.

Tent No. 7. Walking wounded department.

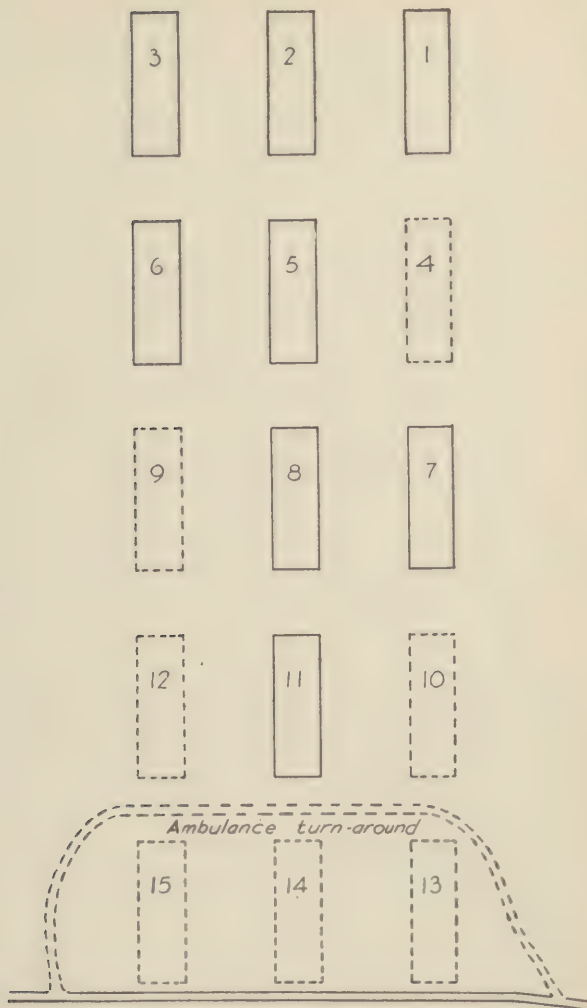
Tent No. 8. Litter wounded department.

Tent No. 11. Evacuation department.

Tent No. 4. Baths (for gas cases).

Tents Nos. 9, 10, 12 to 15. Additional tentage to be erected as required.

(Tents indicated by solid lines in diagram, and in italics in legend constitute the *basic unit*.)



*For Explanatory Note, see facing page*

**Figure 129. Clearing Station Under Canvas When No Necessity For Concealment Exists.**

by departments rather than by items of equipment. Upon arrival at the site of the station, each vehicle is directed to the location of the department to which its load pertains. Personnel are organized into permanent details for establishing the several departments of the station. Each detail unloads the equipment of its department, erects such tentage as is required, and arranges the equipment of the department for use. For further details, see FM 8-5.

(2) *Early priorities.* As soon as the station is opened there is a demand for sterile water and for boiling water for sterilization. Hot liquid foods are also needed early. Hence, heating means are among the first priorities in the establishment of a clearing station. (See also e(1) below.)

*e. Signs and markers.* (1) *Geneva Cross.* When secrecy is not desired, the site may be marked with the Geneva Cross. This is done in two places: a conventional Red Cross flag is hoisted on a flag pole and a ground marker is laid out to indicate to enemy fliers the nature of the installation. Because the Red Cross does not register on aerial photographs, the Geneva Cross is laid out in black and white, either a white cross on a black background or *vice versa*. It may be improvised with canvas or salvaged sheets. The arms of the cross should be not less than 24 feet in length and 8 feet in width. It should be placed near the station and where it is clearly visible from the air.

(2) *Directing signs.* Signs indicating the location of the clearing station should be posted along the ambulance routes, particularly at road intersections. The military police on duty in the area should be informed of the location.

**373. Operating Clearing Station.** *a. General.* The functions of a clearing station are similar to those of a collecting station. The principal difference between the two installations is that, because of more elaborate equipment and a more favorable location, the clearing station is able to undertake certain measures essential to further evacuation of casualties that are impracticable or impossible in a collecting station.

*b. Administration.* (1) *General.* The administration of a clearing station includes all the housekeeping functions, supply, and accounting for both the unit and the patients. The headquarters office ordinarily includes the unit CP and the section devoted to patient's records; while the supply section, to lessen confusion, is usually located apart from the other two administrative sections. The kitchen is located conveniently, but where it does not interfere with other departments.

(2) *Command post.* If tentage be used, it is usually located in a portion of a tent adjacent to the admission tent. It is operated in the same way as any unit headquarters.

(3) *Clearing section.* This section is devoted to the maintenance of records of patients, and its operations are completely separated from those of the command post, although these two sections may be located in the same tent or building. From data furnished at intervals by the admitting and evacuating departments, it prepares periodical consolidated reports to the division surgeon. For the forms of such

reports, see FM 8-45. In the event that any dead are buried by clearing unit personnel, this section records the data required by higher authority, including the location of the graves, with sketches of the plots when practicable.

(4) *Supply section.* This section is charged with unit supply, property exchange, and salvage of clothing and equipment of patients. A tent or space in a building is set aside for its operations, but it must also provide representatives at the admitting and evacuating departments. The supply section of the clearing unit should maintain a small reserve, especially of medical supplies, to prevent shortages while awaiting replenishment by the supply officer of the division medical unit. Once a clearing station is in operation, the daily needs can be anticipated with a fair degree of accuracy.

The supply section also collects and disposes of in accordance with the instructions of the division commander the clothing and equipment removed from patients.

*c. Admission.* (1) *General.* All patients are received in this department, regardless of the manner in which they arrive or the character of the disability. Incoming ambulances are unloaded at this department by a litter squad.

(2) *Property exchange.* The supply section maintains a supply of litters, splints, and blankets in the admitting department. When a patient is admitted from an ambulance on a litter or with attached splints or blankets, an exact exchange is made at once with the ambulance driver.

(3) *Sorting.* The admitting officer examines each patient and determines his immediate disposition within the clearing station. Cases are classified primarily into the sick and the injured, and secondarily into litter and walking cases. Gassed patients may fall into either class, depending upon the lesions.

(4) *Records.* A qualified clerk keeps a record of all patients admitted and furnishes it at intervals to the clearing section of the administrative department. The necessary information is obtained from the emergency medical tag on the patient, or by questioning him. In the event that a patient arrives without an EMT, one is made out and attached to him. For the form of the records kept in the admitting department, see FM 8-45.

(5) *Equipment and valuables.* The equipment brought with the patient is turned over to the representative of the supply section. Valuables are not ordinarily taken from patients at a clearing station, but every effort must be made to safeguard them. The looting of wounded is a capital offense in time of war.

(6) *Space for patients awaiting treatment* must be provided in the admitting department. Cases requiring immediate attention are taken at once to the proper department.

*d. Litter and walking wounded departments.* Patients are taken from the admitting or shock treatment departments to one or the other of these treatment departments, given the necessary medical or surgical care, and sent as the individual need demands either to the ~~shock~~ treatment or evacuation

departments. Treatment is directed toward preparing the patient for immediate return to duty or for further evacuation; and is restricted to the changing or adjustment of dressings, arrest of hemorrhage, and administration of prophylactic sera and narcotics. If the condition of the patient does not permit immediate evacuation, the evacuation department is so notified in the event that he is transferred to that department. A concise record of the treatment given is recorded on the EMT.

*e. Shock treatment.* This department is under the supervision of the officer in charge of litter wounded, with a specially trained noncommissioned officer in direct charge. Although the facilities for treatment in a clearing station are limited, the treatment of shock can be made effective with well-trained personnel, and is of the greatest importance. Transfusions of preserved blood or blood-replacing solutions are practicable. All treatment given is recorded in the EMT. Patients are usually transferred to this department direct from the admitting department, but may be transferred from any of the other technical departments.

*f. Treatment of gassed cases.* These cases must be isolated from others, and, if more than one type of gas is used, it may be necessary to isolate the different types of cases from each other. Bathing facilities must be provided for the treatment of mustard gas injuries. The personnel must be specially trained. Cases requiring venesection may be sent to the litter-wounded department for this operation. Usually, if mustard cases occur, they will occur in great numbers, and the clearing station must be reinforced to deal with them.

*g. Dental department.* A small dental department is established to give emergency treatment to afflictions involving the teeth which may be just as incapacitating as a more serious condition. Many of these cases can be returned to full duty at once. In addition, the services of the dental surgeon are available to any of the other departments in the treatment of surgical conditions of the jaws.

*h. The pharmacy and laboratory* are in charge of a specially trained technician. Ordinary clinical laboratory examinations are practicable, including blood typing.

*i. Evacuation.* (1) *General.* All patients including those who die in the station are disposed of through the evacuation department. As soon as other technical departments have completed treatment of a patient, he is transferred to the evacuation department where he is cared for until disposition is made of him.

(2) *Sorting.* The sorting in this department is the most important of all within the division. Here the decision is made as to whether or not the patient will be retained within the division. Patients are classified for disposition as follows:

(a) Patients to be held for further care at the request of another department.

(b) Patients to be returned to another department for further treatment, usually for shock.

(c) If there be a surgical hospital in immediate support, patients to be transferred to that agency at once.

(d) Patients to be evacuated by a medical unit of a

higher echelon, ordinarily to an evacuation hospital. This class of cases is further subdivided into litter and sitting cases, and into priorities for evacuation.

(e) *Bona fide* minor casualties to be returned to duty without guard.

(f) Malingerers and deserters fit for duty to be turned over to military police.

(g) Prisoners of war. (See (3) below.)

(3) *Disposition of casualties.* (a) *Patients transferred from division.* These include patients transferred to surgical hospitals within the division area and to other medical installations farther to the rear. The records of such patients are closed. Their equipment is retained by the supply section. Each must have an EMT properly made out and attached to his person, and with entries complete to date. The loading of the transport for such patients and, in case more than one type of transport be used, the type of transport for each patient is controlled by the evacuation officer.

(b) *Patients returned to duty.* Patients not under arrest may be returned to their organizations in one of several ways. The choice of methods depends upon the situation. They may be permitted to return individually, either afoot or on transport returning toward their organizations. They may be held at the clearing station until a group is collected; this group may be returned in charge of a noncommissioned officer, either one who is a discharged patient or another detailed for the purpose. Or they may be held at the clearing station until sent for either by their organizations or by another agency designated by the division commander. Malingerers and deserters must be placed in arrest and delivered to the military police at the clearing station. A written statement of the alleged offense should accompany each such case. Their individual equipment must be restored to all patients returned to duty.

(c) *Prisoners of war.* Prisoners of war are disposed of as any other patients. If they require further treatment, they are evacuated. Whether or not a guard is furnished is decided by the military police or higher authority. When in the clearing station, prisoners of war who are fit for some duty should be employed. Their retention for duty is a command decision.

(d) *Deaths.* All deaths in the station are reported to the evacuation department. This department closes the records of such cases and sends them to the clearing station. (See b (3) above.)

(4) *Records.* A record of the disposition of all patients, whether by death, evacuation, or return to duty, is maintained in the evacuation department. For a form for the evacuation record, see FM 8-45. This record is submitted at intervals to the clearing section.

(5) *Property exchange.* A representative of the supply section is stationed in the evacuation department to supervise the property exchange in connection with patients evacuated.

**374. Closing Clearing Station.** a. *General.* It requires approximately 2 hours for a trained unit to close, strike, and load a clearing station. The necessity for closing a station

must be anticipated, whenever possible, and orders issued in sufficient time. It will often be possible to contract the station prior to closing if warning is given, thus saving time when the hour of closing arrives.

*b. Evacuation.* The critical factor in closing a clearing station is the disposal of patients. The station commander should keep the proper authority informed at all times of his evacuation requirements. If a surgical hospital is in immediate support, nontransportables and other patients may be transferred to it. However, the clearing unit is responsible for the patients in its station, and the station may not be closed until proper disposition has been made of them. If patients must be abandoned, adequate shelter and a care-taking detachment must be left for them.

*c. Procedure.* The sequence of the operations involved in closing a station is practically the reverse of those involved in opening it. This is:

(1) The personnel on duty in each department pack their equipment and place it where it can be loaded.

(2) The vehicles allotted for the equipment of the several departments are driven to the proper places, and the equipment is loaded by the personnel on duty in the various departments. Drivers control the stowage and check the equipment from a loading list.

(3) If canvas has been used, tent-striking squads are formed and assigned to the several tents. Tents are struck, folded, and loaded by these squads.

(4) The transport is formed for movement.

(5) The enlisted personnel of the unit forms in a skirmish line and polices the area.

(6) The sanitary detail closes the last latrine.

(7) The unit commander inspects the area.

**375. Heavy Tent Pitching.** *a. (1) Pitching the pyramidal tent. (using 4-man squad).*

*Step No. 1. Unfolding the tent; driving the corner wall loop pins.* Numbers two and three men unfold the tent over the area which it is to occupy while the number one man obtains six short pins and the number four man obtains two mauls, one of which he places on the right side of the tent and the other on the left. All men then grasp their respective tent corners with the number one man at the right front corner, number two at the right rear, and so on. Numbers two and three now pull their corners to the rear with numbers one and four holding fast. (The tent is now lying on the ground with the inner surface down.) The number one man fastens the door. Numbers one and two men drive the right front and right rear corner pins, and numbers three and four men drive the left front and left rear corner pins.

*Step No. 2. Driving remaining wall loop and corner guy rope pins; inserting the pole.* Each man now secures six short pins and places them on a line with each wall loop. Number one man places his at the front, number two at the right, three at the rear and four at the left. The numbers one and three men drive the pins while numbers two and four align them. Now each man secures one long pin and proceeds to his respective corner; he measures out three and one-

half pin lengths diagonally from the corner, aligns the pin with the opposite corner and drives it. Then numbers one and two men secure the pole and place it under the tent. While this is being done the numbers three and four men secure the hood and place it, opening it to the front, on the top of the pole. Each man secures his respective corner guy rope.

*Step No. 3. Tent raised; driving remaining guy rope pins; corner uprights inserted.* Numbers one and two enter the tent and take the top of the pole, number three enters and takes the bottom, and number four remains outside at the rear of the tent. When the one and two men grasp the pole they raise it shoulder high. At the command "RAISE" the pole is brought to an upright position. The numbers one and three men remain at the pole while the numbers two and four men secure their respective corner guy ropes. Then each man secures six long pins and places them on his side of the tent. Numbers two and four drive them while numbers three and one align them. All men now fasten the guy and hood ropes and each man secures one corner upright and places it under his corner. The area is policed. All mauls, extra pins, etc., are brought to the front of the tent.

(2) *Striking and folding the pyramidal tent by steps. (four men.)*

*Step No. 1. Removing pins and loosening ropes.* Numbers one and three men pull all short pins except the right and left corner pins and remove the corner uprights, bringing them all up front. While this is being done the numbers two and four men remove all long pins except the four corner guy pins, and bring them up front. They also unfasten the hood ropes and slacken all guy ropes, except the four corner guy ropes.

*Step No. 2. Striking tent.* Numbers one, two and three men now enter the tent and number four goes to the rear where he grasps the hood ropes. At the command "DOWN" the tent is lowered to the ground, toward the rear. The number four man folds the hood while the rest of the men remove the pole, bring it up front, and then remove the four corner guy pins and bring them up front.

*Step No. 3. Folding the tent.* Numbers two and three men now go to the top of the tent and pull it as far to the rear as the two remaining pins will permit. Numbers one and four men go to the two front corners, pull the corner pins, and straighten out the tent. Then numbers one and four men grasp their respective corner wall loops and, individually, walk to the opposite corner and return. (This movement folds the two side walls.) They then straighten out the door and pull out the two corner pins. (The front and rear sides of the tent are now lying smooth and flat and the two side-walls folded inward, each on itself.) The numbers two and three men place the hood in the top ring and begin to fold from the top toward the bottom, each fold being about two feet wide—the last fold should reach the wall seam. All men now proceed to the bottom of the tent and grasp the edge, folding it upwards until the wall seam is exposed.

(The final fold of the top of the tent (the ring) should be withheld until the fold is made from the bottom so the ring will be lying on top.) All ropes are laid along the folded canvas except the two on the center width. While numbers one and four go to their respective sides and fold the tent toward the middle, securing it with the two remaining ropes, numbers two and three police the area.

*b. Pitching and striking the ward tent.* (1) *Designation of landmarks on the tent.* The ends and sides of the tent are numbered 1-2-3-4, beginning at the front end and continuing clockwise. The poles are numbered from front to rear 1-2-3-4 as are the rings at the top of the tent.

(2) *Organization of the tent pitching squad.* A squad of eight men and one noncommissioned officer are required. The squad is counted off, dividing the squad into the customary four sets of files or minor squads, numbered 1-2-3-4 from right to left.

Each file works at an end or side as follows:

No. 1. file—The front end (including the right front corner and No. 1 pole).

No. 2 file—The right side (including the right rear corner and No. 2 pole).

No. 3 file—The rear end (including the left rear corner and No. 3 pole).

No. 4 file—The left side (including the left front corner and No. 4 pole).

(3) *Pitching ward tents by steps.*

After designating the direction in which the tent will face and placing a marker for the right front corner, the noncommissioned officer commands: "PITCH TENT." The squad proceeds as follows:

*Step No. 1. Distribution of corner and door wall loop pins; unrolling the tent.*

All rear rank men—Secure an axe or maul and place it at the side or end of the tent at which they are to work.

No. 1 front rank—Secure eight short pins and proceed to the right front corner of the tent area, throwing a pin to each corner of the tent area and two pins to each end for the fixing of the doors. He places the right front corner pin at the marker where it is driven by No. 1 rear rank.

Remainder of the squad—Unroll the tent.

*Step No. 2. Unfolding the tent; fixing the doors; driving the corner wall loop pins.*

All men—Throw all hoods and storm guys to the front of the tent.

Nos. 1 and 3 files—Pull out the doors of the tent; all men then go to the bottom of the tent, grasping hold of the top skirt, pulling the skirt to the left so that the inner surface of the tent is on the ground. The men then drop the skirt and walk over the tent to the other side, grasping the skirt and pulling it so that the No. 1 file can put the corner wall loop on their corner pin; the men then drop the skirt and go to their respective rings, pulling them to the right until rings are about 18 inches inside the right skirt.

Nos. 1 and 3 files—Fix the doors, No. 1 file taking care of the front door and No. 3 file the rear door. The door is tied by overlapping the folds of the door in place and placing a short pin through the wall loops on each side at the junction of the door.

No. 4 file—The front rank man, inserting a short pin through the left front corner wall loop, pulls the front of the tent taut. When aligned by the noncommissioned officer, he moves the pin in 6 inches toward the right front corner for slack. The pin is driven by the rear rank.

No. 2 file—Does likewise after No. 4 file drives their pin.

No. 3 file—Stretches the tent to the left and rear to its fullest extent. The front rank man inserting a short pin through corner wall loop moves it 8 inches toward the center of the tent. The rear rank man then drives the pin. In the meantime, the files are unrolling the storm guys.

*Step No. 3. Distribution of all remaining pins; driving the corner guy rope pins.*

All men—Secure sufficient pins for respective sides or ends of the tent. The front rank men get short pins and place one at each wall loop while the rear rank men get long pins and place one in line with each wall loop along the guy pin line.

All front rank men—Place the corner guy pin in position. The pins are driven by the rear rank men. The position of the corner guy pins is  $5\frac{1}{2}$  long pin lengths from the corner pin and in line with the eighth wall loop of the opposite side of the tent. Fix alignment ropes.

*Note:* For the purpose of training and demonstrations it is considered good practice to use alignment ropes for the alignment of all pins.

Procure and fix alignment ropes (the storm guy ropes are used for this purpose). One set of ropes is stretched between the four corner wall pins and another set between the four corner guy pins. All pins are driven outside the alignment ropes.

*Step No. 4. Driving the remaining pins.*

All men—Drive all pins. The wall pins are driven straight into the ground, one for each wall loop. The guy pins are driven sloping toward the tent at a 30-degree angle, one in line with each wall loop and on the guy pin line which extends between all corner guy pins. The front rank men drive them. When Nos. 1 and 3 files have finished driving their pins they assist Nos. 2 and 4 files respectively. (This equalizes the pin driving.)

Remove the alignment ropes, placing two opposite each ring on the right side of the tent. (Long pins: 64, 24 to each side, 8 to each end. Short pins: 44, 20 to each side, 2 to each end. Corner wall pins are already in; the two pins used in tying doors can be used at each end).

Place all guy ropes, fully slackened and in proper order, over the second notch of the guy pins. (Make certain that the correct rope—the one sewn in the canvas and extending to the ring—is used as the corner guy rope). Untie the doors and remove the four corner wall loops from the corner wall pins.

*Step No. 5. Inserting the tent poles; hoods and storm guy ropes in place, preparatory to raising tent.*

All front rank men—Proceed and insert their pole through their respective ring of the tent, putting the butt of the pole through the ring first and then the pike of the pole through the collar of the ring.

All rear rank men—Get hoods and place them on their poles with the opening to the left while the front rank men support the poles.

Each file—Now secures and places two storm guy ropes over the pike of their pole.

*Step No. 6. Tent raised.*

All men—Go under the tent, each to his proper pole, front rank to the top of the pole and rear rank to the bottom. Each front rank man raises his pole about four feet.

The noncommissioned officer now checks the hoods and guy ropes on each pole.

The noncommissioned officer commands: "ARE YOU READY?" Each front rank man calls out from front to rear, NO. 1, READY, NO. 2, READY, etc. If not ready, NO. 1, NOT READY, etc. When all are ready, the noncommissioned officer commands: "RAISE."

The tent is raised by elevating the poles to the vertical, the front rank men raising the poles while the rear rank men keep the bottom of the poles on the ground. As soon as the tent is raised the rear rank men leave the tent, place corner wall loops over the corner wall pins and then each tightens his respective corner guy rope. The front rank men remain at the poles until they are aligned by the noncommissioned officer. The noncommissioned officer then commands: "ALL TIGHTEN." The front rank men place the wall loops over the wall pins while the rear rank men tighten the guy ropes and storm guys. Nos. 1 and 3 files assist Nos. 2 and 4 files, respectively. Each file places the corner wall poles in position.

(In case it is desired to roll the sides of the tent, all men first tighten all guy ropes and then proceed inside the tent and roll the sides.)

*Step No. 7. Policing the area.*

All men—Police the area. All extra pins are picked up and placed in containers. Axes and mauls are placed in front of the tent on the right side with handles inclined toward the door. Each file is responsible for the policing of their areas. The noncommissioned officer gives the tent a final inspection.

*(4) Striking the ward tent.*

*Step No. 1. Removing the wall loop pins and slackening the ropes.*

At the command STRIKE TENT, given by the noncommissioned officer, each file proceeds to their respective side or end of the tent and act as follows:

All front rank men—Remove all wall loops and pull all wall pins except the right front corner and right rear corner ones. They also remove the corner wall poles and carry them together with the short pins to the front of the tent.

All rear rank men—Slacken all guy ropes fully and untie all hood ropes.

*Step No. 2. Removing the tent poles.*

All front rank men—Proceed to their respective poles within the tent and move the bottom of the pole about 24 inches to the left.

All rear rank men—Take position on the right side of the tent, each opposite his respective ring, securing the anchor rope of the storm hood, ready to pull the hood from the pole when the tent is struck.

The noncommissioned officer gives the command DOWN. The front rank men carry the poles to the left, out under the left side of the tent. The poles are then carried to the front of the tent and piled. The rear rank men drop the hoods.

*Step No. 3. Guy rope pins removed; hoods and storm guy ropes rolled.*

All men—Remove all the long pins, disengaging the rope from the pins. Remove the pins in the same manner as they were driven, leaving just the right front corner wall loop pin and right rear corner wall loop pin and bring them to the front.

All men—Then roll up the hoods and storm guys and bring them to the front of the tent.

*Step No. 4. Folding the tent.*

Each file—Goes to their ring at the top of the tent and on the command of the noncommissioned officer drag the tent to the right as far as the two remaining wall pins will permit. This action folds the tent with the inner surfaces together. Pull corner wall pins.

Nos. 1 and 3 files—Straighten out the doors of the tent.

Nos. 2 and 4 files—Straighten out the skirts of the tent.

*Step No. 5. Folding the tent, continued.*

The tent being ready to fold, the men take positions as follows:

Nos. 1 and 3 files—At the doors which are pulled out to their fullest extent.

Nos. 2 and 4 files—Stand on the tent.

No. 2 file—Of the rear rank stands at the first ring.

No. 2 file—Of the front rank takes his position on the opposite side on the skirt.

No. 4 file—Takes position at the fourth ring in the same manner as the No. 2 file.

All men—Being in place, the No. 1 and No. 3 files walk in toward the center of the tent, drawing the doors in. All men go to the bottom of the tent, grasp the skirts and fold them inward until the wall seam is showing. All men now go to the top of the tent, grasp it and, standing on the tent, make two 18-inch folds, bringing the top of the tent to the edge of the upturned skirt.

*Step No. 6. Rolling the tent.*

No. 4 file—Throws in all guy ropes, except the front four.

Remainder of squad—Procure the hoods and storm guy ropes and distributes them along the tent.

Entire squad—Now makes its last fold, folding the top folds over the skirts.

- No. 4 file—Forces out all the air within the tent by taking short steps down the tent.
- Nos. 2 and 3 files—Then roll this into a drum shape roll, starting the roll from the rear. The four loose guy ropes are now used for securing the tent roll, crossing the ropes at right angles about the roll.
- Nos. 1 and 4 files—Then give the area of the tent a final policing.

## RULES OF LAND WARFARE

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## SECTION I

## LAWS OF WAR IN GENERAL

**376. General.** The laws of war are the well-established and generally recognized rules that regulate the conduct of war both on land and on sea. In this chapter, only such laws as apply to land warfare will be considered.

**377. Laws of War.** These include:

a. Unwritten rules not formally agreed upon, although generally observed. Such rules change with the times, as public opinion changes and new means of waging war are devised.

b. Rules agreed upon in international conference binding only those that agree to the rules in writing.

## SECTION II

## THE HAGUE CONVENTIONS

**378. General.** The Hague Convention and several international conferences have been held to consider, among other things, the treatment of prisoners of war and of inhabitants of occupied territory, and the general conduct of hostilities. The last Hague Convention was held in 1907.

**379. Declaration of War.** No nation may commence hostilities against another without first making a formal declaration of war. This law of war is frequently violated today; yet, curiously enough, it was the one rule that the framers of The Hague Conventions agreed upon unanimously. Neutral powers are supposed to be notified of the state of war.

**380. Belligerents and Nonbelligerents.** The laws of war separate the population of a nation at war into two classes—belligerents (those belonging to recognized military forces) and nonbelligerents (the civil population).

a. Belligerents may engage in any of the acts of war recognized as legal by the laws of war without forfeiting protection guaranteed to prisoners of war in case they are captured by the enemy.

b. Nonbelligerents are prohibited from engaging in combat and in other forms of direct action against the enemy except in self-defense. If they violate this law of war and are captured by the enemy, they are not entitled to the protection guaranteed prisoners of war and may be punished.

**381. Prisoners of War.** Prisoners of war must be treated humanely. They are permitted to keep their personal property, but all military equipment and papers are taken from them. Except commissioned officers, they may be required to work, provided the labor is not excessive and has no connection with military operations. Work connected with the care of the sick and injured has been considered proper, and prisoners of war have been required to assist in medical service. Every prisoner of war is required, when asked, to give his true name and grade, and he may be punished for refusing so to do. *He is not required to name his organization.*

## SECTION III

### GENEVA CONVENTION

**382. General.** The laws of war applying to every aspect of warfare, other than the problems associated with sick and wounded, are included in The Hague Conventions (see sec. II); but The Hague Conventions merely approve the rules established in the Geneva Convention in these words: "The obligations of belligerents in respect to the sick and wounded are regulated by the Geneva Convention."

**383. Care of Sick and Wounded.** Officers, soldiers, and other persons officially attached to armies, who are sick or wounded, will be respected and cared for, *without distinction of nationality*, by the belligerent in whose power they are.

**384. Abandonment of Sick and Wounded.** Whenever it becomes necessary to abandon sick and wounded to the enemy, if military conditions permit, a detachment of medical troops with essential equipment and supplies must be left with the sick and wounded to care for them until the enemy has taken them over.

**385. Duties of Belligerent After Engagement.** After every engagement, the belligerent who remains in possession of the field of battle will take measures to search for the wounded and to protect the wounded and dead from robbery and ill treatment. He will see that a careful examination is made of the bodies of the dead prior to burial or cremation and will make every effort to record the identity of dead enemies as well as of his own men.

**386. Protection of Medical Troops and Property.** Medical troops, installations, and equipment are to be protected so long as they are not used to commit acts injurious to the enemy. This protection is extended to the dental but not to the veterinary service.

**387. Medical Service Emblem.** The distinctive emblem of medical service (the Red, or Geneva, Cross) must be displayed on all flags and brassards, as well as on all equipment, used by the medical service. This emblem cannot be used by any other branch of the military service.

## SECTION IV

## VOLUNTARY AID SOCIETIES

**388. General.** Voluntary aid societies who provided a great part of care and treatment of the sick and wounded prior to the development of the medical service of the Army, have no responsibility to the Government for such care and they are now restricted for the most part to providing comforts and luxuries not obtainable officially. Their personnel and equipment while so engaged are protected by the Geneva Convention in the same manner and are subject to the same provisions as those of the Medical Department. The Medical Department cannot share its responsibility for care or treatment of sick and wounded soldiers with any agency.

**389. American National Red Cross.** See AR 850-75.

## CHAPTER 24

### CLERICAL RECORDS AND REPORTS

**390. Clerical Records and Reports.** Below are listed some of the forms in common use.

#### *a. W. D., A. G. O. Forms.*

**No. 1. Company Morning Reports.** One copy. A permanent record prepared by the commanding officer of the company or detachment and submitted to the commanding officer of the regiment, separate or detached battalion, or similar unit and in the case of separate or detached companies, to the commanding officer of the next higher administrative unit, or of the post, camp, or station. See AR 345-400.

**No. 2. Headquarters Morning Reports.** One copy. A permanent record provided for the purpose of accounting for officers and enlisted men not belonging or attached to a company or to a detachment using a Company Morning Report, and for Army nurses, warrant officers, and contract surgeons. See AR 345-400.

**No. 5. Daily Sick Report.** One copy. A permanent record prepared by the commanding officer of a company or detachment and sent to the place of holding sick call by the noncommissioned officer in charge and returned by the same means to organization. See AR 345-415.

**No. 6. Duty Roster.** One copy. List of officers or enlisted men by name that is kept for the purpose of recording duty performed by each person. See AR 345-25.

**No. 9. Monthly Roster.** Four (or more) copies. Prepared monthly or at certain other intervals, such as on the day the command is organized, reorganized, demobilized, or rendered inactive. Normal disposition of copies as follows: Original to The Adjutant General, one copy to the chief of the arm or service concerned, one copy to the headquarters of the corps area, and one copy retained for file. See AR 345-900.

**No. 13. Report of Enlistments.** One copy. Prepared and forwarded to The Adjutant General by the recruiting officer. See AR 600-750.

**No. 15. Report of Survey.** Whenever loss or destruction of, or damage to public property occurs, the responsible officer will accomplish W. D., A. G. O. Form No. 15 in triplicate within 30 days, unless prevented by explained exceptional circumstances, and send all copies to the commanding officer or appointing authority for approval, disapproval, or such other action as he may deem pertinent. After action by appointing authority, the original and one copy are forwarded to the corps area commander and the third copy to the accountable officer. See AR 35-6640.

**No. 21. Enlistment Records, Regular Army.** One copy. Prepared by the recruiting officer for every soldier enlisted, and forwarded to The Adjutant General. See AR 600-750.

**No. 23. Report of Enlisted Men Enlisted for, Reenlisted in, or Transferred to Certain Arms or Services.** One copy. Prepared by the commanding officer of the company or detachment upon receipt of soldier's service record. Sent to the chief of the arm or service concerned. Fact of mailing with date should be entered under remarks in the service record. See AR 600-750.

**No. 24. Service Record.** One copy. Prepared by the recruiting officer. Accompanies soldier until end of his enlistment. Then sent to The Adjutant General by the commanding officer of the company or detachment to which the soldier belongs. See AR 345-125.

**Nos. 24-1 to 24-7, incl. Insert to Service Record.** Furnished to record data, when the space allotted in the service record is insufficient. See AR 345-125.

**No. 25. Extract from Service Record.** One copy. Prepared by the custodian of the service record upon desertion, transfer, individual change of station, etc. It is filed with the records of the unit. See AR 345-125.

**No. 26. Assignment Card.** One copy. Prepared by the commanding officer of the company or similar organization upon the receipt of

an order assigning or transferring an enlisted man to his command. Forwarded to The Adjutant General. See AR 615-200.

No. 29. Authorization for Allotment of Pay. Two copies. Original mailed by the commanding officer of the unit to the Finance Officer, United States Army, Washington, D. C. See AR 35-5520.

No. 29-1. Authorization for Change of Allotment. Two copies. Same remark as above. See AR 35-5520.

No. 29-2. Authorization for Deduction of Pay. Two copies. Original mailed by the commanding officer of unit to the Director of Insurance, Veterans' Administration, Washington, D. C. Duplicate retained for file. See AR 600-100.

No. 30. Notification of Discontinuance of Allotment or Deduction. Two copies. This is a double form—Discontinuance of Allotment printed on one side and Discontinuance of Deduction on the other. Same procedure as for W. D., A. G. O. Forms Nos. 29 and 29-2, respectively. See AR 35-5520 and AR 600-100.

No. 30-1. Notification of Reinstatement or Suspension of Allotment. Two copies. This is a double form—Notification of Reinstatement on one side and Notification of Suspension on the other. Same procedure as for W. D., A. G. O. Form No. 29. See AR 35-5520.

No. 31. Furlough. Two copies. Original sent to headquarters for signature of the commanding officer. Not delivered to soldier until expiration of furlough, then signed by company or detachment commander to certify date of return. Both copies sent to Finance Officer for payment of furlough ration money. See AR 615-275.

No. 32. Individual Clothing Record. One copy. In case of transfer, accompanies soldier. True copy made and retained for file. See AR 35-6680, 35-6720, and 615-40.

No. 33. Individual Equipment Record. One copy. See AR 35-6680, 35-6720, and 615-40.

No. 35. Individual Clothing Slip. Two (or more) copies. Used in the issue of clothing to individual enlisted men and in the transfer of accountability for individual equipment in their possession upon change of station. See AR 35-6560, 35-6680, and 615-40.

No. 36. Statement of Charges. Three copies. Prepared by the commanding officer of the company or detachment. Original to the accountable officer; one copy to the responsible officer; and one copy retained for file. A separate Statement of Charges will be made for property of each supply branch. See AR 35-6620, 35-6640, and 345-300.

No. 38. Report of Physical Examination of Enlisted Man Prior to Discharge or Retirement. Two copies. Prepared by commanding officer of the company or detachment, signed by the soldier concerned. Sent to the surgeon for physical examination of the soldier. Returned to the commanding officer of the company or detachment who transmits the original to The Adjutant General with service record. One copy retained for file. See AR 40-100.

No. 39. Notification of Discharge. One copy. Prepared by the officer who prepares the final statement and sent to the disbursing officer who is to pay the account. Used in case there is not any finance officer located where the soldier is discharged. See AR 345-465.

No. 40. Certificate of Disability for Discharge. Three copies. Prepared by company commander. Sent to the board of medical officers through the officer convening the board, then to the corps area commander. The original is returned to the company commander, who, after discharging the soldier, sends it to The Adjutant General. See AR 600-500, and 615-360.

No. 41. Designation of Beneficiary. One copy. Prepared by company or detachment commander and sent to The Adjutant General. Prepared in case of change of beneficiary subsequent to enlistment. See AR 600-600.

No. 42. Change in Address of Beneficiary or Next of Kin. One copy. Same remarks as above. See AR 600-600.

No. 44. Report of Desertion. Four copies. Prepared by the commanding officer of company or detachment. Original and two copies forwarded to The Adjutant General with service record. Copy retained for file. See AR 615-300.

No. 46. Report of Apprehension or Surrender of a Deserter. Three

copies. Prepared by the commanding officer of the company or detachment. All copies sent to The Adjutant General, who pastes the original in the service record, which is returned to the commanding officer of the post, camp, or station at which the deserter is in confinement. See AR 615-300.

**No. 49. Application for Retirement.** Two copies. Signed and submitted by the soldier to his organization commander who in turn forwards it to The Adjutant General through the post or regimental commander, with information in his indorsement as to whether or not soldier has lost any time under AW 107 during his current enlistment. See AR 615-395.

**No. 52. Report of Death.** Three copies. Prepared by the surgeon or by the soldier's immediate commanding officer if medical officer is not present or available, in which case it is also signed by a civilian physician. Original and one copy to The Adjutant General. One copy retained for file. A fourth copy will be forwarded to soldier's commanding officer when death occurs away from home station or post. See AR 600-550.

**No. 54. Inventory of Effects.** Three copies. (See AW 112). Prepared in the case of every person whose effects are under the control of the military authorities. See AR 600-550.

**No. 55. Honorable Discharge from the Army of the United States.** One copy. Prepared and signed by the commanding officer of the company or detachment and presented to a designated field officer or the commanding officer of the post, camp, or station for his signature. Given to the soldier who must present it to the finance officer paying final statement for notation as to fact of payment. See AR 345-470.

**No. 56. Discharge from the Army of the United States (blue).** One copy. Same remarks as above. See AR 345-470.

**No. 57. Dishonorable Discharge from the Army of the United States (yellow).** One copy. Same remark as above, with the exception that discharge is not delivered to soldier until his release from confinement. See AR 345-470.

**No. 63. Report of Physical Examination.** One copy. Used for the annual physical examination of all officers, warrant officers, and members of the Army Nurse Corps. Used to record the physical examination of the above personnel prior to discharge, dismissal, or resignation and at certain other intervals, such as promotion. See AR 40-100 and 40-105.

**No. 64. Physical Examination for Flying.** Two copies. Forwarded directly to the Chief of the Air Corps, who approves or disapproves them and returns one copy to the station for the file of the flight surgeon. Used to record the physical examination of candidates for commission in the Air Corps and the transfer of officers thereto. Used for January and July examination of all pilots and rated observers. See AR 40-110.

**No. 73. Basic Strength Return.** Four copies. Rendered by the commanding officer of each branch of the service represented at a post. Original to The Adjutant General. Copy to the chief of the branch. Copy to the corps area concerned and copy retained for file. See AR 345-50, 345-55, and 345-100.

**No. 115. Charge Sheet (for Courts-Martial).** Three copies. Any person subject to military law may prefer charges. After preparation they are signed and affidavit completed as prescribed by AW 70. All copies are submitted to the commanding officer for investigation and such action as he deems appropriate in each case. If tried by summary court-martial the three copies are disposed of as follows: The original copy is filed at post headquarters, a copy sent to The Adjutant General, and a copy to the officer exercising general court-martial jurisdiction. See paragraph 31 and appendix 3, Manual for Courts-Martial.

**No. 181. Enlistment Record, Regular Army Reserve.** Three copies. Accomplished by the recruiting officer or other officer authorized to accept enlistments for the Regular Army Reserve. The original copy (white) is sent to the commanding general of the corps area in which the reservist's home is located. The second copy (pink), is sent to The Adjutant General. The third copy (green) is given to the reservist. See AR 155-5.

**b. F. B. I. Military Fingerprint Card.** One copy. Prepared by the recruiting officer or other officer designated for the purpose for every soldier enlisted, and forwarded to The Adjutant General. See AR 345-120.

**c. W. D., M. D. Forms.**

**No. 16a. Issue Slip—Expendable Medical Property.** Made out and signed by the officer in charge of ward or department. Names of articles desired will be written as they appear in the Medical Department Supply Catalog. Slip will be completed by the officer in charge, who will insert the date and receipt same. Filed at the medical supply office. See AR 40-1705.

**No. 16b. Issue Slip—Nonexpendable Medical Property.** Made out and signed in duplicate by the officer in charge of the ward or department. Names of articles will be written as they appear in the Medical Department Supply Catalog. Both the original and duplicate slip will be completed by the receipt of the officer in charge, who will insert the date. Original will then be filed at the medical supply office and the duplicate returned to the requesting officer for file with his retained memorandum receipt. See AR 40-1705.

**No. 16c. Credit Slip—Nonexpendable Medical Property.** Made out and signed in duplicate by the officer in charge of the ward or department where the property has been in use. Names of articles will be written as they appear in the Medical Department Supply Catalog. If property to be turned in is unserviceable from any cause other than fair wear and tear in the military service, a statement to that effect will be attached showing what action has been taken to fix responsibility. Both the original and duplicate slip will be completed by the receipt of the storekeeper, who will insert the date. The original will then be returned to the officer turning in the property for file with his retained memorandum receipt, and the duplicate will be filed at the medical supply office. See AR 40-1705.

**No. 16d. Exchange Slip—Nonexpendable Medical Property.** Made out and signed by the officer in charge of the ward or department for which the serviceable property is needed. Names of articles desired will be written as they appear in the Medical Department Supply Catalog. If property to be turned in is unserviceable from any cause other than fair wear and tear in the military service, a statement will be attached showing what action has been taken to fix responsibility. The slip will be completed by the receipt of the officer in charge, who will insert the date. It will then be filed at the medical supply office. See AR 40-1705.

**No. 21. Hospital Laundry List.** Copy sent to The Surgeon General, with the voucher for laundry service in case the service is being accomplished by a civilian laundry. A copy sent to The Surgeon General as a monthly report in case the service is being accomplished by a Government-owned laundry. One copy retained. See AR 40-590.

**No. 42. Contract for Laundry Work** (with appendix sheet "A"). Six copies. Three copies sent to The Surgeon General or corps area surgeon for approval. Three authenticated copies prepared and distributed as follows: one copy for the contracting officer, one to the Returns Officer, General Accounting Office, and one to the disbursing officer. See AR 5-160, and 40-590.

**No. 49. Statement of the Hospital Fund.** Two copies. Original to The Surgeon General through the corps area surgeon. Retained copy for file. See AR 210-50.

**No. 49a. Employee's Certificate of Indebtedness for Hospital Service.** Three copies. Marked "Original", "Duplicate", and "Triplicate." Two copies to the officer under whom the employee is serving. One copy retained by the commanding officer of the hospital. See AR 40-590.

**No. 51. Report Sheet for Report of Sick and Wounded.** Two copies. Original with report cards and other records to the corps area surgeon for checking and then forwarded to The Surgeon General. Copy filed. See AR 40-1025.

**No. 52. Register Cards.** Two copies. Original to the corps area

surgeon along with W. D., M. D. Form No. 51. Copy filed. See above and AR 40-1025.

No. 52a. Index Record of Patients (Card). Register index. One copy. Kept in the hospital and prepared by all hospitals in peace or war, wherever located. Also used for keeping the "diagnosis index" and other indices at fixed hospitals in addition to its use as a nominal index of patients. See AR 40-1025.

No. 52b. Emergency Medical Tag. Used only in the field. Two copies. Original attached to all sick, wounded, and dead, as soon as practicable. See FM 8-45.

No. 52c. Field Medical Card. One copy. Started at the first hospital in the field where treatment is furnished. Accompanies the patient until return to duty, death, or arrival in zone of the interior. Removed and sent with the monthly report of sick and wounded to the chief surgeon, or corps area surgeon, as the case may be, for transmittal to The Surgeon General. See FM 8-45.

No. 52d. Field Medical Record Jacket. For field use. Used for inclosing the field medical card, emergency medical tag, and any other clinical record of value. See FM 8-45.

No. 54. Surgeon's Request for Service Record. Used by the commanding officer of hospital to make direct call upon the proper organization commander for the soldier's service record in the event of failure to receive same in due time. See AR 40-590.

No. 55a. Clinical Record Brief. A clinical record will be kept by fixed hospitals in time of peace or war, excepting those serving in a theater of operations. This form and 55j are used for every patient treated in hospital and for serious cases treated in quarters. See AR 40-1025.

Note. The other lettered blanks of the 55 series will be used as the nature or importance of the case may warrant.

No. 56. Malarial Register. One copy. Prepared for every case or carrier of malaria and should be kept up to date until patient is definitely cured or terminates his military service. In the event of transfer, accompanies the patient to his new station. In the event of termination of his military service, will be sent to The Surgeon General. See AR 40-230.

No. 57. Report of Dental Service. Rendered monthly from every station and separate command where a dental officer has been on duty during the month. If post is under the immediate control of the War Department, report is sent direct to The Surgeon General. One copy retained. If forwarded through the corps area surgeon, two copies are forwarded and one retained. See AR 40-1010.

No. 59. Report of Examination for Sergeant, Staff Sergeant, Technical Sergeant, or Master Sergeant, Medical Department. One copy. See AR 615-15.

No. 71. Surgeon's Morning Reports of Sick. Signed each day by the medical officer responsible for its rendition. Promptly forwarded to the organization commander who will enter the strength of the command. See AR 40-1005.

No. 72. Morning Report of Ward. Rendered each morning by ward officer. Sent to the registrar along with clinical records, etc., of completed cases. Not a permanent record. See AR 40-590.

No. 72a. Consolidated Morning Report of Wards. Kept by the Registrar of the hospital. See AR 40-590.

No. 73. Diet Card. Made out daily by the ward officer and sent to the hospital mess. Not a permanent record. See AR 40-590.

No. 74. Mess Account. Kept by noncommissioned officer in charge. Filed at the end of every month with retained hospital fund papers for that month. See AR 40-590.

No. 75. Patient's Property Card. Made out in duplicate. Original filed with hospital records; duplicate given to patient. See AR 40-590.

No. 76. Patient's Property Tag. Used for identification of patient's property. See AR 40-590.

No. 77. Venereal Prophylaxis Slip. Record of prophylactic treatment. Authenticated daily by the initials of the officer in charge of prophylactic station. May be destroyed after 3 months. See AR 40-235.

No. 78. Syphilitic Register. Maintained for each person in active military service who has syphilis. Kept on file in the office of the

surgeon. On "cure" or separation from the service, the register will be forwarded to The Surgeon General. See AR 40-235.

No. 79. Register of Dental Patients (Card). Made for every person admitted to a dental clinic for dental treatment. See AR 40-1010.

No. 81. Immunization Register. Made out in duplicate. Original in cases of officers, warrant officers, and nurses to the person concerned. Original in cases of enlisted men to the organization commander for entry on soldier's service record. Duplicate copy will be filed in an alphabetical immunization file of the medical department records of the station or command to which the individual belongs. See AR 40-215.

No. 86ab. Statistical Report (first and second sections). Rendered by the surgeon of every separate station or command. Made out in triplicate. See AR 40-1080.

No. 86c. Statistical Report (third section) See above remarks.

*d. W. D., Q. M. C. Forms.*

No. 22. Statement of Clothing Charged to Enlisted Men. One copy. Used by company commanders to list the names and amount charged to clothing allowance of men to whom clothing has been issued. Sent to officer designated for keeping service records. See AR 35-6580, 35-6720, and 615-40.

No. 364. Weekly Collection and Delivery Sheet. Three copies. Shows names of each enlisted man sending laundry. Original and duplicate to laundry each week; triplicate retained for file. See AR 30-2135.

No. 365. Monthly Roster and Statement. Three copies. Shows names of enlisted men of the organization who have signified intention to have quartermaster laundry service during the month. Original and duplicate to laundry on first day of month; triplicate retained for file. See AR 30-2135.

No. 374. Enlisted Men's Laundry Slip. One copy. A list of laundry sent by enlisted men to accompany each bundle. Sent to laundry. See AR 30-2135.

No. 400. Requisition. Three copies. Used in requisitioning all supplies except those for which special forms are provided. Original and duplicate to commanding officer for approval and in turn to quartermaster for issue. Triplicate retained. See AR 35-6540, and 35-6720.

No. 409. Requisition and Receipt for Clothing in Bulk. Three copies. Normally submitted by organization quarterly for clothing charged against clothing money allowance. Original and duplicate to commanding officer for approval and in turn to quartermaster for supply. Triplicate retained for follow-up purposes. See AR 35-6540, 35-6560, and 35-6720.

No. 411. Requisition and Receipt for Brooms, Brushes, Matches, Mops, Toilet Paper, Soap, etc. Three copies. Quarterly requisitions by organizations for items appearing thereon but not exceeding in money value of budget credit allotted to organizations. Original to commanding officer for approval and in turn to the quartermaster for supply. Triplicate retained. See AR 30-3010, 35-6540, and 35-6720.

No. 412. Requisition and Receipt for Stationery and Office Supplies. Three copies. See remarks about W. D., Q. M. C. Form No. 411.

No. 413. Requisition and Receipt for Cleaning and Preserving Materials. Three copies. See remarks about W. D., Q. M. C. Form No. 411.

No. 414. Requisition and Receipt for China and Glassware. Three copies. See remarks about W. D., Q. M. C. Form No. 411.

No. 424. Stock Record Card for Loose Leaf Binder, Organizations or Posts and Stations. One copy. Used for keeping stock records. See AR 35-6560 and 35-6720.

No. 431. Receiving Report. Three copies. Used as voucher to stock record account to cover receipt and acceptance of articles purchased. Original and duplicate to finance officer designated to make payments. Retained copy, voucher, to stock records. See AR 35-6560 and 35-6720.

No. 434. Shipping Ticket. Five copies. Used when property accountability is transferred from one accountable officer to another. Original and duplicate to consignee, who, upon receipt of property, will sign one copy and return to consignor. Third and fourth

copy to finance officer of the corps area where consignee is located. Retained copy, credit voucher, to stock record account of consignor. See AR 35-6560 and 35-6720.

**No. 445. Over, Short, and Damaged Report.** Three copies. See AR 35-6560, 35-6640, and 35-6720.

**No. 460. Ration Return.** Three copies. A requisition on the quartermaster for rations. Signed and submitted by officers under whom persons entitled to these are serving. After approval by the commanding officer, original and duplicate sent to quartermaster sales officer. Third copy retained. See AR 30-2210 and 35-6720.

**No. 487. Memorandum Receipt.** Three copies. Used by accountable officer who issues property to individual or organization who in turn assumes responsibility used as credit or debit voucher to memorandum receipt account. Original and duplicate to organization or individual to whom property was issued, who will sign original and return to accountable officer. Retained copy used for follow-up purposes. See AR 35-6520 and 35-6720.

**No. 488. Account of Property on Memorandum Receipt.** One copy. Used by property officer to show where property is located for which he is accountable. Postings are made from W. D., Q. M. C. Form No. 487. See AR 35-6520 and 35-6720.

*e. W. D., I. G. Forms.*

**No. 1. Inventory and Inspection Report.** Responsible officer will prepare and sign two copies, listing the property to be inspected. Action of the inspector will be final. See AR 20-35.

**No. 2. Inventory and Inspection Report of Public Animals.** Unserviceable public animals will be listed on this form. Prepared whenever needed. See AR 20-35.

## THE RATION

**391. The Ration.** A ration is the allowance of food for the feeding of one person for one day. Each soldier is authorized to receive one ration each day that he is on the active list of the Army.

**392. Kinds of Rations.** There are several different kinds of rations used in the Army of the United States, but the ones in which you will be interested are the following:

a. The *garrison ration* is that which the Government prescribes in time of peace for all persons entitled to a ration except under special circumstances when other rations are prescribed. The different items such as meat, fresh vegetables and fruit, beverages, bread, and other articles of food which make up the ration are called "ration components." The number of components and the amount of each required to give a soldier a well-balanced and nourishing daily diet have been carefully determined by food experts. The money value of the ration is figured each month from the wholesale costs of food to the Government, and your organization mess account is credited with the total amount required to feed all the men in your unit. The meals served by your organization mess sergeant in time of peace, and while your organization is in a post, camp, or cantonment, will usually be prepared from the components of the garrison ration. After the mess sergeant has made up his menus he will buy the various articles of food required from the money which the Government has credited to your organization mess account. Some of these items he may buy from the quartermaster commissary. Others he may buy from local markets or farmers, in order to take advantage of certain foods in season or because the commissary may not have them in stock. Any savings which he makes are called "ration savings" and become part of your unit mess fund, to be expended by your organization commander on extras for the mess on holidays or other special occasions.

b. The *field ration* is that prescribed for use in time of war or other emergency. In time of peace it may be used sometimes for training purposes. Its components are prescribed by the War Department or the commanding general of the field forces. No ration savings are permitted and the components are issued "in kind." This means that instead of your mess sergeant buying the various components of the ration from the quartermaster or in local markets, the quartermaster will issue to him certain items of food sufficient to feed all the members of your organization. There are four kinds of field rations:

(1) *Field ration A* corresponds as nearly as practicable to the peacetime garrison ration and contains "perishable" items such as fresh meat and vegetables. It is issued as often as the circumstances will permit.

(2) *Field ration B* corresponds as nearly as practicable to field ration A, except that nonperishable or canned products replace the perishable items.

(3) *Field ration C* consists of previously cooked or prepared food, packed in sealed cans, and which may be eaten either hot or cold. Each ration consists of three cans of meat and vegetables and three cans of crackers, sugar, and soluble coffee.

(4) *Field ration D* consists of three 4-ounce bars of concentrated chocolate.

(5) Sometimes the field ration may be a combination of types C and D. In this case it will usually consist of two cans of meat and vegetables, two cans of the crackers, sugar, and soluble coffee, and two of the 4-ounce bars of concentrated chocolate.

**393.** Our Government spends more money for the food of its soldiers than any other nation in the world. A great deal of time is spent on the training of mess sergeants and cooks and you will soon discover that your food is better prepared, there is more of it, and it has a greater variety than that of most families in civil life. It is especially selected to build up your body and give you the energy and endurance which will carry you to success on the battlefield. If at first it seems strange to you and you miss the meals with which you are familiar, do not be tempted to eat in neighboring civilian restaurants. You will profit both in your pocket and stomach if you eat all of your meals in your organization mess.

**394.** When you go into the field your mess sergeant and cooks will accompany you. There is special cooking equipment in your organization which will follow you. On this your food can be prepared in the same way as it is cooked on the stoves of your barracks or cantonment. During combat all organization kitchens are usually grouped in sheltered locations in rear where the meals can be prepared without interference by the enemy. Immediately after dark, trucks bring the cooked meals forward so that they can be distributed by carrying parties.

**395. During Campaign.** During a campaign the commanding general of your division or a higher commander may direct that each soldier carry a field ration as part of his field equipment. He may decide to do this because he feels that the condition of the roads or transportation may delay the arrival of the cooked meals and in such a case he wants to be sure that no soldier goes hungry. A ration which is carried by a soldier is called an individual reserve. It will probably be field ration C or D, or a combination of both.

**396. a.** It may sometime happen during campaigns that you and one or more of your comrades may be separated from your unit. If there is another organization near you, you will always be able to get a meal from it by reporting to its first sergeant or mess sergeant, giving your name and organization and explaining how you happen to be separated from your own unit.

**b.** If there is no other organization near, it may then be necessary for you and your comrades to cook your own meals, using your mess kits for this purpose and the food you have with you. Since you will probably have field ration C with you, this will be very easy. Simply heat one or more of the

cans in hot water, and open them. If you, or any of your comrades, have had boy scout training you will probably be able to prepare a very good meal from the ration.

**397. Fire for Cooking.** a. Remember that the best fire for cooking is a small clear one, or, better yet, a few brisk coals. With your bayonet, dig a trench in the ground, laid with the wind, about a foot long, 4 inches wide, and 6 inches deep. Gather a number of sticks about 1 inch in diameter. Dead limbs taken from a tree are dryer than those picked up from the ground. Split some of these and shave them into kindling. Start the fire in the trench gradually, piling on the heavier wood as the fire grows. When the trench is full of burning wood, allow it a few minutes to burn down to coals. Then rest the meat can and cup over the trench and start the cooking. You may support them, if necessary, with green sticks.

b. If the ground is rocky or stony, and you cannot scrape a trench in the soil, you may make your fire between two small, flat stones, or with two parallel logs. These should be placed so that the draft will pass between them. The meat can can be placed on the stones, across the fire, and the cup for boiling coffee at the end, away from the draft, where it will get the most heat. Always see that the fire is completely out before you leave.

## CHAPTER 26

### PAY AND ALLOWANCES

**398. Rate of Pay.** When you first enter the military service, your rate of pay will be \$21.00 per month. This pay is in addition to the food, clothing, medical, and dental attention which the government provides you without charge. After a period of 4 months, however, and provided you have not demonstrated inefficiency or other unfitness, your pay will be raised to \$30.00 per month. From that point on your pay need only be limited by your ambition, your attention to duty, and the manner in which you qualify yourself for promotion. Remember that promotion is on a strictly competitive basis. Your organization commander will promote the man whom he believes is best qualified for the next vacancy, and on whom he has found he can depend. The various grades, with their rates of monthly pay as authorized by Congress in the act of September 16, 1940, are given below:

First grade—Master sergeant .....	\$126.00
Second grade—First sergeant and technical sergeant ..	84.00
Third grade—Staff sergeant .....	72.00
Fourth grade—Sergeant .....	60.00
Fifth grade—Corporal .....	54.00
Sixth grade—Private, first class .....	36.00
Seventh grade—Private with over 4 months' service ..	30.00
Private with less than 4 months' service during first enlistment period or whose inefficiency or other unfitness has been determined under regulations ...	21.00

**399. Specialist.** If you are a private or a private, 1st class, you may have certain qualifications which will enable you to be rated as a specialist and receive the following pay in addition to the pay of your grade. Specialist ratings are given in a limited number to men trained to do certain kinds of work such as electricians, mechanics, radio operators, riveters, woodworkers, clerks, or cooks:

	<i>Per month</i>
Specialist 1st class .....	\$30.00
Specialist 2d class .....	25.00
Specialist 3d class .....	20.00
Specialist 4th class .....	15.00
Specialist 5th class .....	6.00
Specialist 6th class .....	3.00

**400. Air Corps.** If you are in the Air Corps, during such time as you are authorized to take part regularly and frequently in aerial flights, you will receive additional pay of 50 per cent of the pay of your grade. If you are a private, private, 1st class, corporal, or sergeant and are rated as an air mechanic, 1st class, you will receive the pay of the second grade; or if you are rated as an air mechanic 2d class, you will receive the pay of the third grade during the time you hold your rating.

**401. Decorations.** For certain decorations or awards, for distinguished service, you will receive an additional amount of money each month.

**402. Furlough Allowance.** If you are granted a furlough,

you are entitled to an allowance for rations during the period of the furlough. This allowance will be paid to you when you report back to your station on or before the date of expiration of the furlough. It will not be paid if you overstay your furlough unless you are excused for overstaying by your commanding officer. It will not be paid if you fail to report back to your own station.

**403. Deposits.** While you are in active military service you may deposit with the Government, as savings, any amount not less than \$5.00. Your deposits will be repaid to you when you are discharged and, if they have been deposited for 6 months or longer, will draw interest. Your deposits are not subject to collection for debts unless you authorize, in writing, collection of amounts due the United States or for your discharge by purchase.

**404. Allotments.** You may make an allotment of your pay for the support of your family or dependent relatives, or for payment of premiums for commercial life insurance if such insurance is on your own life. The amount allotted will be deducted from your pay each month and paid directly to the insurance company or person you have designated in your allotment.

**405. Government Insurance.** You may take out a policy for National life insurance on your own life. The premiums may be paid by you directly to the Veterans Administration in monthly payments, or you may authorize their deduction from your pay each month.

**406.** If you desire any further information regarding allotments, deposits, or Government insurance, see your first sergeant. He will be glad to help you.

**407. Deductions.** Deductions will be made from your pay if you are found responsible for loss or damage to Government property and if you are absent without leave or absent sick, not in line of duty. You do not lose pay for sickness or injury in line of duty or for absence in confinement; however, the time lost by absence in confinement, by absence without leave, or by absence due to sickness not in line of duty has to be made up at the end of your enlistment period. Two-thirds of your monthly pay may be taken to satisfy any amount which you may owe the United States or which you may owe to the company fund, post exchange, or United States Motion Picture Service.

**408. Travel Pay.** Upon honorable discharge from the service you will be entitled to travel pay at the rate of 5 cents per mile for the distance from the place you are discharged to the place you were accepted for enlistment, enrollment, or muster into the Army, not including sea travel.

**409. Burial Expenses.** The Government provides the burial expenses for a soldier who dies while in active service.

## CHAPTER 27

### LAST WILL AND TESTAMENT

410. Every soldier should have his will drawn up, witnessed, and signed. A form appears below which is legal anywhere in the United States. You can change it at any time you care to, but fill it in and sign it in the presence of two witnesses *now*.

#### FORM OF WILL

All of my estate I devise and bequeath to.....  
(Name of beneficiary)  
for his own use and benefit forever, and I hereby appoint  
her  
him my executor  
her trix without bond, with full power to sell, mortgage, lease, or in any other way dispose of the whole or any part of my estate.  
Dated..... 194.....

.....  
(Signed by soldier in presence of witnesses)  
Subscribed, sealed, published, and declared by.....  
....., testator above named, as and for his last  
(Name of soldier)  
will and testament in the presence of each of us, who at his request and in his presence, in the presence of each other, at the same time, have hereunto subscribed our names as witnesses this ..... day of ....., 194...., at .....

(Name of place)  
Signature and addresses .....  
of two witnesses .....

## APPENDIX

### GLOSSARY OF COMMON MILITARY EXPRESSIONS

- AWOL.**—Absent without authority.
- Aide, or Aide-de-camp.**—A personal assistant to a general officer.
- Base.**—The element on which a movement is regulated.
- Blind.**—A money fine of a court-martial sentence.
- Bob-tail.**—A dishonorable discharge.
- Bucking for orderly.**—Extra efforts for personal appearance when competing for post of orderly to the commanding officer.
- Bust.**—To reduce a noncommissioned officer to the grade of private.
- Chow.**—Food.
- Cits.**—Civilian clothing.
- CO or KO.**—Commanding officer.
- Distance.**—Space between elements in the direction front to rear.
- Dogtags.**—Identification disks.
- Doughboy (dough).**—An infantryman.
- Dud.**—An unexploded shell.
- Field, in the.**—Campaigning against an enemy under actual or assumed conditions.
- File.**—A column of men one behind the other.
- Foxhole.**—Pit dug by a soldier to protect his body.
- GI.**—Government issue; galvanized iron.
- Guard house lawyer.**—A person who knows little but talks much about regulations, military law, and soldiers' "rights."
- Hash mark.**—A service stripe.
- Hike.**—To march.
- Hitch.**—An enlistment period.
- IC.**—Inspected and condemned.
- Interval.**—Space between elements in the direction parallel to the front.
- Jawbone.**—Credit. To buy without money. To shoot a weapon over a qualification course when it doesn't count for record.
- Kick.**—A dishonorable discharge.
- KP.**—Kitchen police.
- Lance jack.**—A temporary or acting corporal with the same duties and authority of a regularly appointed corporal, but without the pay of the grade.
- Mess gear.**—A soldier's individual mess kit, knife, fork, spoon, and cup.
- MP.**—Military police.
- Mule skinner.**—A teamster.
- Noncom.**—A noncommissioned officer.
- OD.**—Olive drab or officer of the day.
- On the carpet.**—Called before the commanding officer for disciplinary reasons.
- Over the hill.**—To desert.
- Pace.**—A step 30 inches long.
- Piece.**—The rifle or weapon.

*Pup tent.*—Shelter tent.

*Reup or takeon.*—To reenlist.

*Shave tail.*—A second lieutenant.

*Skipper.*—The company commander.

*Sniper.*—An expert rifle shot detailed to pick off enemy leaders or individuals who expose themselves.

*The old man.*—The company commander; commanding officer.

*Top sergeant or top kick.*—The first sergeant.

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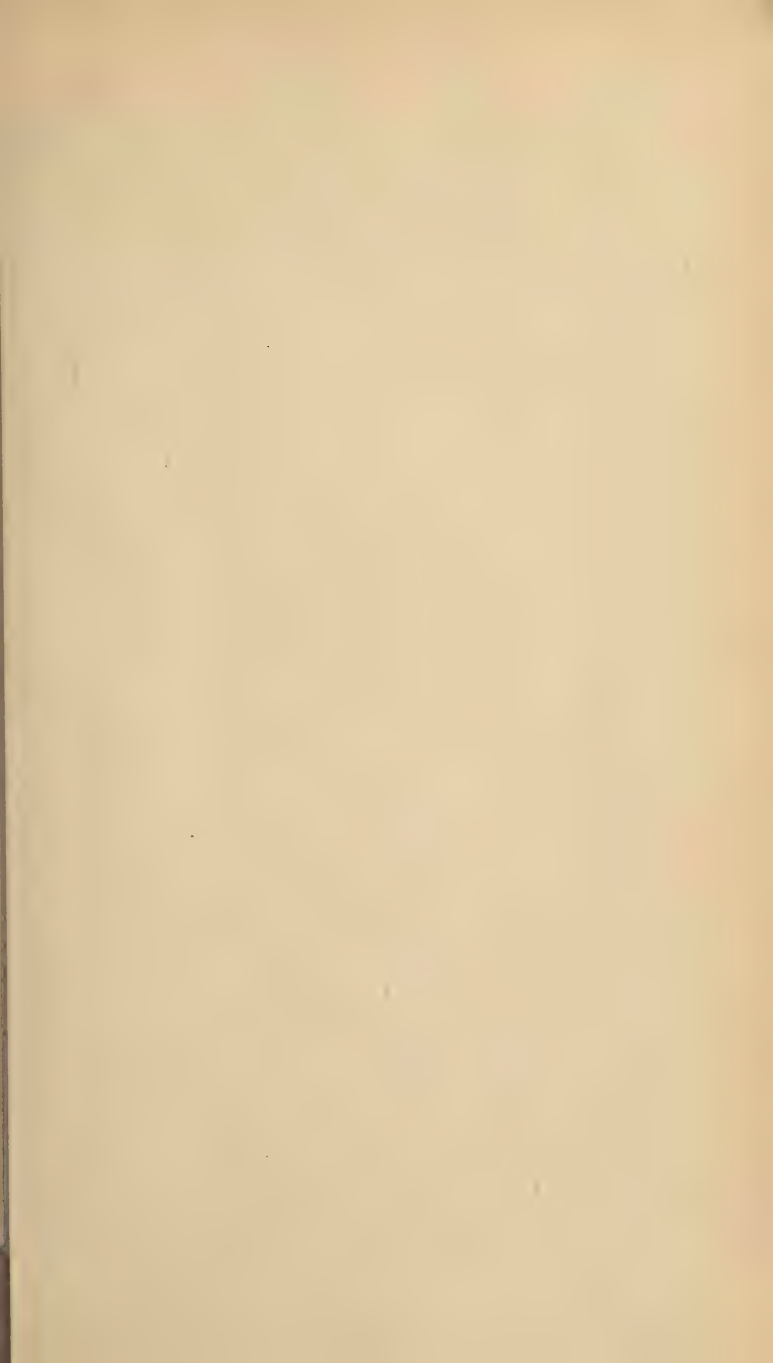
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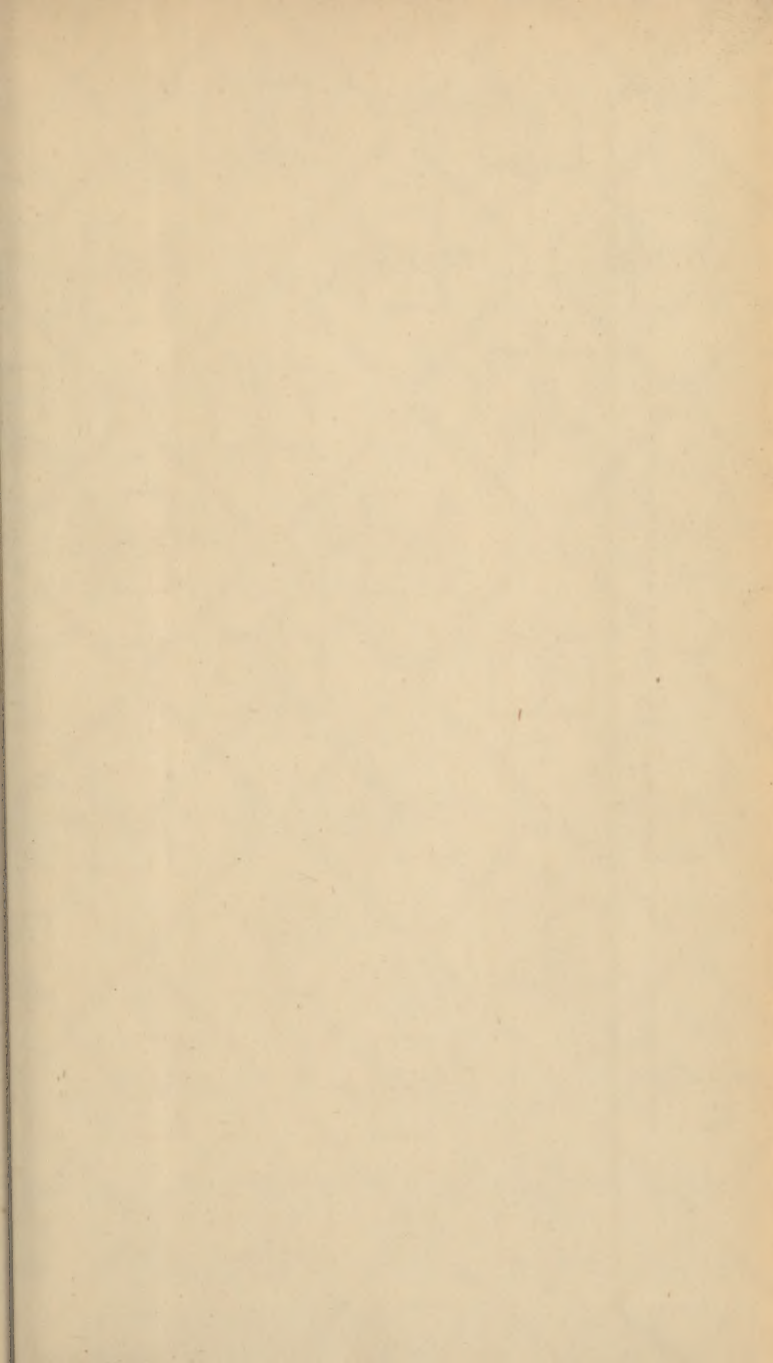
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